The Canadian
Medical Association Journal

Vol. XV TORONTO, NOVEMBER, 1925 No. 11

HIGH BLOOD PRESSURE

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IN recent years the measurement of the arterial blood pressure has become such a routine part of physical examination that few patients are content and think that the doctor has done his duty if he has not applied the cuff to the arm. There is no doubt that the use of all instruments of precision used in diagnosis carries a sting in its tail. None of us are old enough to remember when the clinical thermometer came into general use but doubtless while being of great value it caused a great deal of introspection amongst the public. Even yet we all know the nervous mother whose spirits fluctuate inversely as the temperature of her children, and there was much wisdom in the advice of an old practitioner to such a parent when he told her to smash her thermometer. In the same way the stethoscope caused its crop of introspectives. Here the patient can not read the results directly but can and does do so through the doctor, and what a host of hypochondriacs were made and still are made by the statement that a murmur is present! And coming next to the sphygmomanometer, have the public not been told too much, or perhaps too little? and hence one of the commonest hypochondriacs of the present day is the high blood pressure case. He nurses this diagnosis with the same melancholy tenderness as did his progenitor his liver. In moments of cynicism one sometimes wonders if it would not have been better for the happiness of the public if such instruments of precision had never been introduced into general practice. But they do exist and the laity have learnt a good deal about them, and perhaps under the circumstances such a book as that of Barker and Cole on *Blood Pressure* may do good, although when one sees it on sale in the ordinary book shops a certain amount of doubt creeps in. Personally I think that the public should be taught as much as possible about the prevention of ill-health and as little as possible about actual disease. When they feel ill let them go to their doctor, and even do so for periodic examination, but when they feel well the less they worry about their bodies the better. The reading of medical works by the laity never does anything but harm. The man doing this is apt to get into the condition of the one mentioned in Jerome K. Jerome's *Three Men in a Boat* who after reading a medical encyclopædia for some time came to the conclusion that he had every disease described except housemaid's knee.

So much for the public, but now let us discuss the subject of high blood pressure from a professional aspect. That it is a matter of great importance goes without saying, and it is significant that the insurance companies, who look at the subject from a purely financial point of view, lay great stress on it.

I will not waste time in discussing the factors that normally keep the arterial blood pressure at its *optimum* point for a given individual, (and, by the way, this point varies considerably in different healthy people) but will merely enumerate them. They are, of course, the systole of the heart, the elasticity of the arterial walls, the tonus of the muscular coat of these walls, especially of the arterioles, and probably the active contraction of the muscular coat of the vessels following each wave from the ventricle.

If any of these factors increase in action the pressure tends to rise, and if they decrease it tends to fall. Thus, when the heart beats more rapidly or more powerfully the pressure rises and if the arterioles contract and prevent the blood from freely escaping into the capillary bed it also does so. In the former case the chief rise is in the systolic pressure, while in the latter it is in the diastolic one. If the arteries be rigid from sclerosis the rise is chiefly in the systolic pressure, the wave from the heart being largely carried directly on and not being stored up in the elastic walls as it is normally.

There are many classifications of the different varieties of hyperpiesis, but I think that from a practical point of view the following three classes are useful. These are (1) nervous, (2) toxic, and (3) organic.

All cases of raised blood pressure may be put into one of these three categories, and often with advantage when we come to the question of treatment.

I.—*Nervous Hyperpiesis.*—The blood pressure is very much under the influence of the emotions. Most forms of nervous tension tend to raise it, either by increasing the action of the heart or by causing vaso-constriction or by both. Possibly this is brought about by an increase in the internal secretion of the adrenal glands. Even a medical examination acts in this way and every physician knows that a single reading of the pressure is quite unreliable and hence will leave the cuff on and try the pressure a number of times before coming to any conclusion. Even that may not be sufficient. Not long ago I was seeing an old gentleman with his son who was a physician. The pressure during the hour that I was there read at about 180 mm. and I might have concluded that it was really high if the son had not found it that morning to be 125 mm. Tense nervous strain will keep the pressure up indefinitely. I recall a patient who had great financial responsibilities and his doctor and I always found the systolic pressure to be over 200 mm. He was sent to California for the winter and there lived a quiet life only enlivened by much gentle golf. He brought back with him a list of his pressure readings made by the local medical man and these ran from 130 to 150 mm. When he went back to his heavy work up it went again. Still another case illustrates the effects of nervous tension. A lady suffered from tic douloureux and her pressure was always over 200 mm., and this in spite of many forms of treatment in England and Canada. The attacks of pain were not continuous but the blood pressure was always high due apparently to apprehension of a spell. At last she had the fifth nerve resected for the relief of the tic with complete success, and what interests us here is that ever since that operation, now nearly two years distant, the pressure has run about 150 mm.

Most cases of so-called essential hyperpiesis probably come under this heading, although some of them are no doubt toxic. These patients may go on for years without much disturbance of the health, but all the same the strain on the circulatory apparatus usually tells in time and they tend to drift into our third class of organic cases.

Theoretically, one would expect to find in these patients that it was the diastolic pressure that was chiefly raised, but practically this is often not the case and it is not uncommon to see a systolic pressure of 200 with a diastolic one of 90 mm. and this without any aortic leakage. I see that Janeway noted this fact. A possible suggestion here is that the underlying cause is really a vaso-dilation rather than spasm and that the heart is beating harder in order to keep the mean pressure up to what the tissues require. I recall a man that I watched for over twenty years, who with a constant systolic pressure of over 200 mm. had a diastolic one of 90 to 95 mm. No cause for the systolic rise could ever be found, except that he was a neurasthenic. There was no aortic leakage and the heart did not seem to hypertrophy. In aortic regurgitation the heart increases in force in order to keep up the mean pressure which tends to be low as some of the blood each time flows back into the left ventricle. If in the same way the leakage is through relaxed arterioles the heart must equally beat hard in order to keep the mean pressure up and hence we get a high systolic and a normal diastolic reading.

When any vital centre is insufficiently supplied with blood the general pressure tends to rise in order to get blood there at all costs, and thus a brain tumour or anything pressing on these centres, or a narrowed artery to such a centre, will cause the arterial pressure to rise.. Professor Starling in a discussion on hyperpiesis

at the British Medical Association last July, stated his belief that the most essential cause of the rise was the vasomotor centre automatically raising it to supply its own needs. Thus he would explain even the common rise in nephritis, œdema of the centre lessening the blood supply and hence bringing this compensatory action about. (*Brit. Med. Jour.*, Aug. 1, 1925).

II.—*Toxic Hyperpiesis.*—Various toxins produced in the body during metabolism tend to raise the blood pressure abnormally if they accumulate. Such a one is guanidin which occurs normally in the urine in small quantities and if retained raises the pressure. Its excretion is lessened in some forms of nephritis and R. H. Major would thus explain the rise in blood pressure here. (*Amer Jour. of the Med. Sciences*, Aug. 25, 1925).

It seems that in intestinal disturbances certain toxins may be produced that are of pressor type and when absorbed raise the blood pressure. Russell, of Edinburgh, some years ago wrote much about these. Normally proteins are reduced in the alimentary tract to amino-acids which are absorbed and then broken up in the liver into ammonia and the fatty acids. But in abnormal conditions of the bowel these amino-acids are reduced to amines. The diamines are depressant in action but some of the monamines are pressor and one of them corresponds to tyramine and when absorbed produces a rise in pressure. The ordinary three safeguards against the absorption and accumulation of such toxins are the mucous membrane of the intestine, the liver and the kidneys. If the mucous membrane be unusually permeable more toxins than usual are absorbed. If the liver be sluggish in action or the kidneys be not acting sufficiently these toxins tend to accumulate in the blood and hence the pressure rises. The liver has a very important function in removing toxins from the blood. F. M. R. Bulmer and I found (*Trans. of the Assoc. of Amer. Physicians*, 1922) that when arsenic in the form of salvarsan or its allies was introduced into the blood it was nearly all excreted in the bile, and probably other toxic substances are similarly treated by the liver. It is well known how soon toxæmia develops when the kidneys fail.

The late Professor Huchard, of Paris, used to teach that arteriosclerosis commences as a toxæmia, continues as a toxæmia and ends as a toxæmia, and there was much truth in this although it was not the whole story. We must remember that in a toxæmia not only may the blood pressure rise but the toxins themselves will directly poison the tissues of the circulatory apparatus as well as those of all the organs and hence may produce symptoms which are synchronous but not due to the hyperpiesis. One of the best gauges of the toxæmia of pregnancy is the state of the blood pressure. There are toxins that lower the blood pressure and yet produce toxic symptoms just as there are others which raise the pressure and also produce toxic symptoms, and it is evident that the direct lowering of the blood pressure by any means will not relieve the toxæmia and is an example of bad symptomatic therapy.

Probably the body produces depressor substances which neutralize the pressor toxins and W. J. MacDonald seems to have isolated such a one from the liver, or rather has an extract which contains such a one.

III.—*Organic Hyperpiesis.*—In true arteriosclerosis the blood pressure may or may not be high. It takes a very widespread sclerosis of the arterial tree to bring about a rise. Some say that unless the splanchnic vessels are involved it does not occur. Undoubtedly if the arterial system be sufficiently obstructed the pressure rises as is seen experimentally when the abdominal aorta of an animal is ligatured or compressed. Some years ago a young girl came to the Children's Hospital complaining of cardiac distress. We found the heart to be enlarged, and a routine examination soon showed that there was a loud systolic murmur at the base of the chest posteriorly and that no pulse could be felt in the abdominal aorta or its branches. The blood pressure was nearly 200 mm. and the patient was admitted with a diagnosis of obstruction of the thoracic aorta due probably to an enlarged lymphatic gland. There were some big tuberculous glands in the neck and the x-ray showed that there were many apparently similar ones in the posterior mediastinum. She improved under general treatment, but even years later the blood pressure was still too high and the heart greatly hypertrophied, although some pulse developed in the abdominal aorta.

Although a great deal of obstruction is necessary to raise the pressure, a very little interference with the circulation in some vital centre

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will easily do so, the rise being compensatory. Thus, as already mentioned, does a brain tumour or any interference in the vascular supply of a nerve centre act. In this compensatory rise it would be very bad therapy to interfere.

Treatment.—In the treatment of any ailing person it is well to have some system in our procedure as in this way important measures are less apt to be overlooked than if the therapy be conducted in a haphazard manner. The routine that I always follow is the following:—environment, diet, specific treatment and finally symptomatic therapy.

In the case of hyperpiesis the diagnosis is already partially made, but much more than a mere recognition that the pressure is high is required. Is the rise due to nervous, toxic, or organic causes? Is it compensatory in type and hence the best possible for the damaged individual? How are the heart and the blood vessels standing the strain? And, of course, what is the condition of the kidneys? Such questions all come under the first heading and should be as largely as possible answered before proceeding further. When no cause is discovered for the rise this is usually labelled "essential hyperpiesis" which is of course only a cloak for our ignorance.

Environment.—Rest is of great importance in all cases, but the degree of it depends upon the urgency. If the case be a bad one and especially if cardiac distress be present complete rest in bed for several weeks is necessary, and not only physical rest but also mental, which is often quite as important, and be it recalled that apprehension is a great source of nerve tension and hence the doctor should make as light as possible of his findings with the sphygmomanometer. When an active business man is merely put to bed and allowed to conduct his affairs from there he is apt to fidget and gain no benefit. All his worries should for a time be kept from him, and he is often helped by free doses of bromides. Massage is frequently useful in partially replacing the customary exercise.

The blood pressure tends to fall during sleep, but this is not always the case, and J. A. McWilliams, of Aberdeen, has shown that often in disturbed sleep rises occur that may be much higher than are produced by the moderate exercise that such a patient is apt to take when awake, and hence he explains the not uncommon occurrence of sudden death during sleep.

In mild cases of hyperpiesis the patient can go on with his life's work, and it is wonderful how much of the community's best work is done by people who have blood pressures which exclude them from any chance of being accepted for life insurance. All the same, a programme can generally be arranged which will demand less physical and mental strain. Often one can find on enquiry some special form of work that in the individual produces most stress and can advise against this without interfering too much with his general efficiency. In these mild cases, gentle exercise, especially one of a pleasant nature such as golf, is of value, but the patient should be warned to avoid anything that causes him circulatory distress. Also frequent short rests during the day especially after the midday meal are helpful.

Diet.—A general cutting down of the total diet is often necessary. As regards special articles, it has for long been the empirical practice to lessen the intake of purin-containing foods, such as meats (especially red meats), eggs, fish, and tea and coffee. I would like to quote here that eminent physiologist, Professor Halliburton. When speaking of empiricism, he says: "If you have high blood pressure, why does your medical man tell you that you must abstain from beef and mutton? I can picture a sceptical and argumentative physiologist saying, 'Why! the materials you mention and I am advised to take or refrain from taking are in the main composed of protein, and surely it is not physiological to give me such futile advice.' My answer to this would be, 'True, it is not explicable on physiological grounds. It is merely the result of empirical experience. But wait a few years, and it is quite on the cards that by that time science may have stepped in and explained the puzzle just as a few years ago it was able to explain why cod liver oil is better than olive oil.' There is probably in the harmful meats some hitherto unrecognized principle, unrecognized because it is present in minute quantities, or it may be the absence of an indispensable material. 'There is one kind of flesh of men, another flesh of beasts, and another of fishes, another of birds.' I wonder if St. Paul ever imagined that these pregnant words contained more than he intended to convey by them. Lately there has been some doubt thrown upon the effects of a high protein diet in hyperpiesis and three years ago I heard a paper by S. Strouse and S. R.

Kelman (*Trans. Assoc. of Amer. Physicians* 1922) in which they showed that even a very excessive protein diet for a few days did not further raise the pressure, but I still have my doubts, and believe that there is some truth in the very general opinion that it does do so. It may be that it takes weeks or months of such a diet to so act, the toxins accumulating very slowly. Generally speaking I believe that a lacto-vegetarian diet is the best for these people. Alcohol has no effect on the pressure but should be lessened or barred on general principles. Tobacco does raise the pressure slightly but I think that its soothing effects when used in moderation by habitues more than counter-balance this slight rise.

The bowels should be gently open, and if they do not so act naturally the regular use of salines in the morning and an occasional mercurial at night are indicated. There is some evidence that a limitation of the intake of sodium chloride is useful and this should certainly be done if there be any œdema.

The strict regulation of the diet is of most importance in toxic cases but even in the others there may be a degree of toxæmia and it should always be carefully considered.

If a quieter life and the above regulation of the diet do not relieve the pressure it is a common practice to give small doses of potassium iodide and this undoubtedly has a good effect in many cases however it acts. Some say that it is only beneficial in syphilitic cases but with this I do not agree.

Specific Treatment.—An attempt should of course always be made to remove the underlying cause of the raised pressure. In toxic cases the careful dieting and the free elimination may be classed as specific treatment as may also the altering of the environment in nervous cases. The cause may be unremovable as in most instances of compensatory hyperpiesis and then all we can do is to keep the sufferer as comfortable as possible under the circumstances.

Symptomatic Treatment.—In all cases of raised blood pressure the regulation of the diet and of the manner of living will probably do some good and cannot possibly do any harm, and I am old enough to have watched many people go on year after year without any further rise of pressure, keeping free from symptoms when formerly they were far from well.

But if the pressure keeps high in spite of such a simple régime the question arises of how far we are justified in further interfering with it, and here I would divide all cases of hyperpiesis into the two classes, (1) those without symptoms, and (2) those with symptoms.

In the cases without symptoms, individuals who would not be aware of their raised pressure if the doctor had not found it, I believe we should not further interfere. The high pressure may be the *optimum* one for them owing to some bodily abnormality and if we do lower the pressure it gives them distress. A case seen not long ago illustrates this. An old ward patient with hemiplegia had a systolic pressure of 180 mm. The hemiplegia was of long duration and he was quite comfortable except for his somewhat hampered movements. We put him on benzyl benzoate and in a couple of days the pressure was 130 mm. but he felt miserable. The drug was then stopped and the pressure soon rose again and with it his feeling of *bien etre*. Another man was admitted with a failing heart and a pressure of 100 mm. Under rest and digitalis the heart soon regained power and he left the hospital with a pressure of 200 mm. and feeling very comfortable. He needed that pressure for some compensatory reason. By the way, digitalis in therapeutic doses does not raise the pressure unless this is low from cardiac failure and then it does so very efficiently.

Thus, to repeat, symptomless hyperpiesis that does not lessen under careful dieting and the general regulation of the way of living should be left alone.

But when symptoms are present the case comes into our second category. Here it may be the lesser of two evils to lower the pressure for fear of something worse happening and also in order to relieve the existing symptoms. The ordinary symptoms that are apt to occur in cases of high pressure are headache, irritability, breathlessness on exertion or even while at rest (cardiac asthma), passing aphasia or paresis, and angina pectoris. Acute pulmonary œdema is also apt to suddenly occur. As already mentioned, many of these symptoms are really due to toxæmia rather than to the increased pressure, and they may be largely removed by cutting down the diet, free purgation and diuresis. Lately the free use of calcium chloride and potassium chloride has been advocated by Addi-

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son, of Toronto, and others, and this undoubtedly lowers the pressure. Addison believes that it is the chlorine ion rather than the bases that so acts. Liver extract may also be used, but here I only quote W. J. MacDonald as I have no experience of it.

In toxic cases that do not yield to minor measures nothing in my experience equals the good effects of a timely blood-letting. Often one sees the immense benefit that follows a spontaneous hæmorrhage in such patients, and I can recall many cases where this form of *vis medicatrix naturæ* did more good than all our therapy, and therein lies the lesson. A hard-working professional man was found to have dizziness, headache and general malaise. The blood pressure was 180/110 mm. The urine was normal and there was no evident arteriosclerosis. A little later (in the month of November, as a matter of fact) while in an American city, he had a sudden attack of hæmatemesis. The surgeons explored the stomach and duodenum but found no cause for the bleeding, which was so severe that he had to be transfused. For some weeks he was naturally weak but then improved and for months felt better than he had done for years. Then gradually his dizziness and headache, etc., returned and increased until the following November when he had a similar hæmorrhage. Again he soon felt better and then the same symptoms recurred and on the third of November another hæmatemesis floored him. I saw him again three months after this last one and found him feeling well with a pressure of 150/100. I advised him that when he felt his symptoms recurring he should not wait for the gastric hæmorrhage but have a venesection done.

In patients of this kind which belong to the toxic class I have never seen a bleeding do any harm and it nearly always does much good. The pressure gradually falls for several days after the venesection and it is surprising how slowly the rise recurs. It may take months or it may not recur, the body having in the meantime in some way readjusted itself. I know that in the toxæmia of pregnancy and also in uræmia, venesection, although of great value, only produces a short relief, but in hyperpiesis of non-nephritic origin the good results are much more lasting. In cases where venesection does no good the pressure is probably compensatory or nervous or due to some severe arterial disease. The little operation is specially indicated where acute pulmonary œdema complicates the case.

Vaso-dilators occasionally have their place, but it is a very small one except in emergencies such an angina pectoris. The rapid ones, amyl nitrite, or nitroglycerine, are here of great value, and when the case is more prolonged, (the anginous condition rather than angina pectoris), the more slowly acting ones, such as sodium nitrite or erythrol tetranitrate or mannitol hexanitrate, may give much comfort.

Summary

1.—A rise in arterial blood pressure may be due to nervous, toxic or organic causes.

2.—In all cases it is wise to urge a less strenuous physical and mental life, a reduction of diet, especially of the purin-containing articles, and the free action of the bowels.

3.—Beyond the above régime no treatment is required in the absence of symptoms.

4.—Where symptoms are present the pressure may be reduced by various measures, and the value of venesection should be borne in mind in all urgent toxic cases.

Epithelioma and the Chronic Varicose Ulcer.—Leila C. Knox, New York, concludes as follows: There are accurate reports of only fifty-nine epitheliomas arising in chronic varicose crural ulcers. The number of the reported cases is about the same as those arising in scars and fistulas. These occur almost exclusively between the ages of forty and sixty, run a slower course than other squamous cell epitheliomas, and probably lead to metastasis later. They are in no sense benign. It is probable that chronic dermatitis more than the varicosities and altered blood supply alone incites the condition. These tumours seldom arise until an ulcer has been present for at least fifteen years.—*Jour. Am. Med. Ass.*, Oct. 3, 1925.

THE RELATION BETWEEN GASTRIC ACIDITY AND THE HYDROGEN CONCENTRATION OF THE URINE WITH A STUDY OF THE EFFECT OF HISTAMINE*

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INTRODUCTION

INVESTIGATIONS into the relationship between the secretion of hydrochloric acid in the stomach, and the reaction of the urine, have been carried on for many years, and the literature on the subject is extensive. Schittenhelm[1] (1903), Loeb[2] (1905), and Gammeltoft[3] (1911), each observed that gastric anacidity was associated with a relative fixation of the urinary reaction, and of the ammonia excreted at different intervals during the day. It has been generally believed that the changes in the urinary reaction which occur after a meal are dependent upon the secretion of acid in the stomach, and its subsequent resorption from the intestines. This view has been opposed by some workers, notably Hasselbalch[4] and Leathes.[5] Recently, however, the more general view has received strong support from the work of Campbell,[6] Fiske,[7] and Hubbard and Munford.[9, 10]

As the earlier literature on the subject has been reviewed in detail by some of the later writers, particularly Campbell,[6] Fiske,[7] and Hubbard and Munford,[9, 10] a brief discussion of only the more recent literature is given here. As before mentioned, Hasselbalch[4] (1912-16) and Leathes[5] (1919), disputed the generally accepted views. The latter published an article in which he held that the "alkaline tide" was due to changes in the alveolar tension of carbon dioxide, consequent to increased respiratory exchange, brought about by activity following the resting period at night, during which he showed that carbon dioxide accumulated in the body. In 1920 Campbell[6] came forward in strong support of the original view, and in 1921 Fiske[7] again re-stated it with additional supporting evidence. The work of Bennett and Dodds[8] (1921), on the relationship between gastric acidity and carbon dioxide tension in the alveolar air, came as further support to this latter view. In 1922 Hubbard and Munford[9] published a paper in which they showed the relative fixation of the urinary reaction in achlorhydria, and since then have published a series of articles relating to the whole subject, all of which have tended to confirm the gastric origin of the "alkaline tide." In 1924 these workers, together with Allen,[10] showed how various types of diets, having different degrees of stimulus to gastric secretion, could thus vary the urinary reaction. In May of this year Hubbard and Munford[11] (1925) published two papers. In the first they endeavoured to show the practical value of the urinary reaction in cases of achlorhydria, as contrasted with the normal, and in the second they attempted to estimate how much acid in the gastric secretion is actually necessary for the production of the "alkaline tide." Although it would appear that the "alkaline tide" is dependent upon the meals, still it has been shown by Leathes,[5] Grant and Goldman[12] (1920) and Collip and Backus[13] (1920), that the respiratory exchange plays some part in the urinary reaction. The last mentioned have also confirmed the relationship of the urinary reaction to ammonia excretion.

Care has been exercised in the present work to prevent errors from variations in the respiratory exchange, and the principle adopted by Hubbard and Munford,[11] of not accepting small changes in pH as indicating a "tide" unless these were present in more than one consecutive specimen, has been followed throughout.

Methods and material.—The method of determination of the pH of the urine was essentially the same as that described by Henderson and Palmer[14] (1912), with slight modification in the choice of indicators. The 2 per cent. aqueous solution of sodium alizarin monosulphonate was used in all cases where the pH was less than

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7.4, instead of using neutral red for the higher range. The 1 per cent. alcoholic solution of phenolphthalin was used for all specimens with a pH of 8.0 and over. The special precautions described by Marshall[15] were not carried out and, consequently, the results of the determinations are subject to the slight corrections which he has noted. The subjects were all hospital cases who had previously been thoroughly investigated and in the normal were cases free from complicating diseases. In all cases disease of the kidneys and urinary tract was ruled out as far as possible. The subjects were all confined to bed during the test days so as to minimize the effect of muscular activity in increasing the respiratory exchange. Breakfast was given at eight o'clock in all cases, except when the gastric contents were collected simultaneously with the urine specimens after a test meal was given. Dinner was given at twelve o'clock, except in those few cases when it was delayed by gastric analysis. The evening meal was never given until the test was completed. All subjects were instructed to void before breakfast and this specimen was usually discarded. The urine was collected for the test at hourly intervals, commencing at 9 a.m. and continuing until 5 p.m. except as otherwise noted. Specimens were voided by the male subjects directly into narrow cylinders, or otherwise emptied immediately into these cylinders. The latter contained small quantities of toluol and were immediately stoppered. They were subsequently examined during the same day. It was not found necessary to examine them immediately except in those cases as noted by Marshall[15] (1922), having a low degree of acidity, or definite alkalinity. In such cases (especially those with hyperchlorhydria) a second test was carried out, the urine being examined immediately after voiding. Gastric analysis and urine tests were usually carried out independently. When histamine was used, and in certain other instances which are noted, the two tests were done simultaneously. The method of fractional gastric analysis proposed by Rehfuss, Bergheim and Hawke,[16, 17, 18] was used throughout. This method has been the subject of considerable criticism, notably by Gorham,[19] but it was considered to be the most satisfactory in spite of its apparent shortcomings. Certain modifications of this test were carried out in the histamine cases as will be noted later. It will be observed that variations from day to day in the gastric analysis findings were found here, as have been previously recorded by other workers. Ordinary hospital diet was given to the normal subjects and to all others, except those in which the effect of special diets was to be observed. In these cases standard weighed meals were given at 8 a.m. and 12 noon, as noted in Table C. Extra water (200 cc.) was given with each meal in all cases.

Observations.—Normals. Determination of the urinary pH was carried out on sixty-seven subjects having normal gastric findings. Analysis of the results shows that in about fifty-nine cases (86 per cent.) both morning and afternoon "alkaline tides" developed. This figure corresponds very closely with the findings of Hubbard and Munford.[11] In five cases (7.5 per cent) only one "tide" appeared; in three it developed in the morning and in two in the afternoon. In three cases (4.5 per cent.) there was no definite "tide." The average of these findings is shown in Chart I, which also shows the extremes of variation contrasted with the average. It will be noted that the point of lowest urinary acidity occurred most consistently three hours after the meal, while the highest acidity occurred on the average at 9 a.m., 1 p.m.

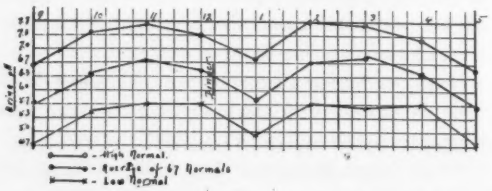

CHART 1.—Shows the curve of the pH of the average of sixty-seven cases having normal gastric findings. The two curves representing the high and low limits of these cases are shown in contrast.

and 5 p.m. This is in accord with the findings of others. The explanation of the high urinary *acidity* at nine and one has been attributed by some workers to an increased excretion of acid in the urine immediately following the ingestion of food, possibly as a result of salivary secretion. However, this does not account for the high acidity in the late afternoon before the evening meal. A satisfactory explanation has not, as yet, been found for this.

In comparing the extremes of variation of the curves as shown in Chart I with the corresponding gastric analyses, it was found that in 75 per

cent. of cases with moderately low gastric acidity there was a high degree of urinary acidity throughout the day. On the other hand, in 85 per cent. of the cases in which urinary reaction tended in the alkaline direction there was a slightly raised gastric acidity.

TABLE "A"

A typical case of hypochlorhydria in which there is a relatively high urinary acidity throughout the day.

Gastric Analysis			Urinary Reaction	
	% of Hcl			
Time	Free	Total	Time	pH
Residuum	0	16	9 a.m.	4.7
15 min. after meal	0	12	10 "	5.0
30 " " "	0	19	11 "	5.4
45 " " "	5	24	12 "	5.1
1 hr. " "	6	27	1 p.m.	4.7
1 hr. 15 min. "	8	30	2 "	5.2
1 hr. 30 " "	6	25	3 "	5.7
1 hr. 45 " "	0	22	4 "	5.7
2 hrs. " "	0	17	5 "	4.7

TABLE "B"

A typical case of hyperchlorhydria (slight) in which there is a relative alkalinity of the urinary reaction throughout the day.

Gastric Analysis			Urinary Reaction	
	% of Hcl			
Time	Free	Total		pH
Residuum	29	49	9 a.m.	6.7
15 min. after meal	15	32	10 "	7.0
30 " " "	24	42	11 "	7.4
45 " " "	30	56	12 "	7.1
1 hr. " "	35	66	1 p.m.	6.8
1 hr. 15 min. "	34	61	2 "	7.4
1 hr. 30 " "	34	59	3 "	7.6
1 hr. 45 " "	30	54	4 "	7.2
2 hrs. " "	28	50	5 "	6.8

Tables "A" and "B" give data showing typical cases of hypochlorhydria and slight hyperchlorhydria respectively. Repeated tests on individual cases have sometimes shown a wide variability of the reaction from day to day. In view of this day-to-day variation of the gastric contents, it was considered of importance to determine whether there was a coincident variation in the pH of the urine. Four cases were investigated with simultaneous gastric analysis and hydrogen ion concentration tests of the urine. In three of the four cases there were conspicuous variations in gastric acidity, with corresponding variations in the pH of the urine; i.e., the higher the gastric acidity the more did the urinary pH tend in the alkaline direction. The fourth case showed fairly marked variation in gastric findings, but the pH curves did not fluctuate noticeably. The results of one of these cases are shown in Chart II.

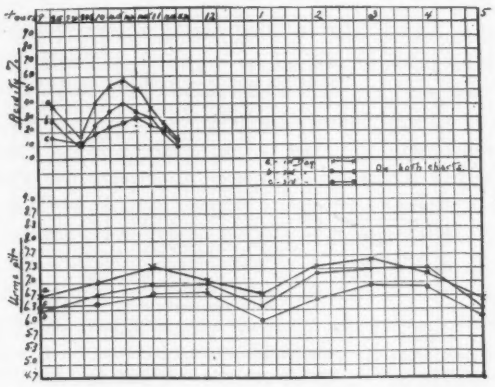

Chart 2.—Shows the variations in gastric analysis findings from day to day with corresponding variations in the urinary reaction. Curves (a) (b) and (c) on both gastric and urinary charts represent the simultaneous tests on different days.

Achlorhydria.—Determinations of urinary reaction were carried out in thirty-one cases of gastric achlorhydria. Of these, ten were diagnosed pernicious anæmia, twelve carcinoma of the stomach, three carcinomatosis with primary focus elsewhere than in the stomach, one case of post-operative gastro-enterostomy with severe emaciation and anæmia, two cases of severe secondary anæmia of unknown cause, and two cases of comparatively normal individuals in whom no cause for the achlorhydria could be found. It was found that in twenty-six of the cases the "alkaline tide" was wanting, the variation in the pH throughout the day not being more than 0.4 pH, and this was independent of food (Chart IIIA). In five cases (four with cancer of the stomach and one with achlorhydria of unknown origin) there was an "alkaline tide" in the morning or afternoon, or both. The other case of achylia of unknown origin which had no "alkaline tide," gave an interesting result which was repeated three times, there being a low urinary acidity throughout the morning and a high degree throughout the afternoon (see Chart IIIB). Several of the cases without "alkaline tide" showed a lower grade of acidity in the first specimen or two than throughout the remainder of the day. An example of this is also shown in Chart IIIB.

The cases of achlorhydria with carcinoma of the stomach, in which an "alkaline tide" developed, had a slightly higher percentage of total

acid in the resting gastric juice than did the others.

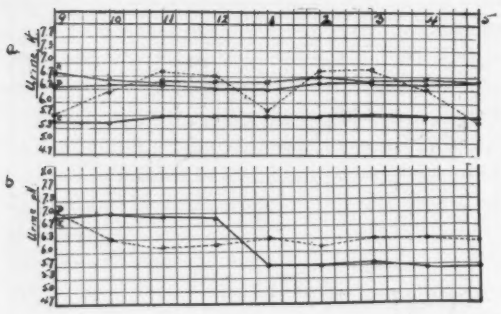

CHART 3.—(a) Shows the urinary reaction of three typical cases of gastric achlorhydria, curves (a, b, and c). The dotted curve represents a normal case for contrast.

(b) Shows two atypical curves of achylia, (d) representing the cases in which the first one or two specimens are less acid, while (e) is the case in which the urine is more alkaline throughout the morning swinging to the more acid side in the afternoon.

Since the urinary reaction after meals in achylia was in most cases negligible, the results would appear to be in favour of the gastric origin of the "alkaline tide."

Hyperchlorhydria.—The urinary reaction was examined in fifteen cases of hyperchlorhydria, and in all but two of these, either a very low acidity or a definite alkalinity of the urine was found. The pH curves of the urine in these cases showed some variability in type, but appeared to fall into three groups. In one group of four cases, the urinary reaction at the commencement of the test showed only a moderate grade of acidity, tending to become more alkaline throughout the day, with very little swing to the acid side at noon, and having the highest alkalinity in the late afternoon. In a second group of three cases, the acidity was fairly high at nine, at one, and at five, with a very marked swing to a definite alkalinity in the intervals. In the third group, which formed the majority, the curve showed a definite alkalinity throughout, with little tendency to become more acid at the usual times. In none of these cases was the "alkaline tide" entirely wanting. Graphical representation of the three types will be found in Chart IV. In the two instances which did not exhibit the expected results, the tides were comparatively normal.

The influence of diet.—The influence of different diets on the urinary reaction was demonstrated by Hubbard and Munford[10] who found that after meals low in protein and relatively high in carbohydrate, the "alkaline tide" was almost absent, while meals high in protein pro-

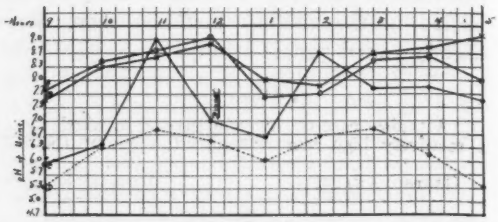

CHART 4.—Shows three typical curves of subjects with gastric hyperacidity contrasted with a normal. Curve (a) represents the type which tends to become more alkaline throughout the day. Curve (b) represents the common type which shows more tendency to become acid at 9, 1, and 5 p.m. Curve (c) shows the type referred to in which there was a marked swing to the acid side at the above mentioned hours, while in the intervals there was a well marked alkalinity.

duced conspicuous "alkaline tides." The importance of these findings warranted their repetition. The results obtained in nine subjects with normal gastric findings are given herewith. In carrying out this work, it was necessary to give a standard weighed diet at 8 a.m. and at 12 noon. Consequently weighed meals of a known content (one with low protein and high carbohydrate content, another with a high protein value, and a third with normal value) were given. The food values of these diets are outlined in Table C.

TABLE "C"

The standard meals used for breakfast and dinner on the test days according to the type of diet required.

Standard Meals	*Protein*	*Fat*	*C.H.O.*
Normal Type.....	20	30	60
High Protein.....	50	33	22
High C.H.O.....	7	5	100

In all of the nine cases it was found that the results tallied with those recorded by the above-mentioned workers; i.e., that the high carbohydrate meals caused the least urinary reaction, the high protein, the most pronounced, while the normal mixed diet resulted in a curve occupying an intermediate position. The three curves in Chart V demonstrate the variations in a normal person. It will be noted that the "alkaline tide" with the protein diet becomes definitely alkaline at its height. A conspicuous change in the curve was observed in five cases, while in all of the cases more or less pronounced variations were found.

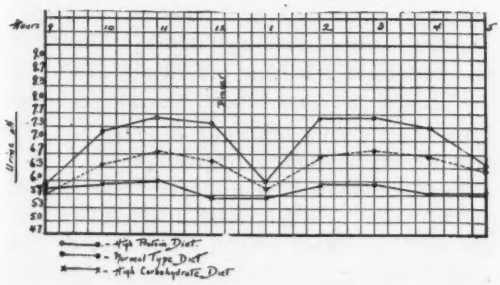

CHART 5.—Shows the influence of different types of diet on the urinary reaction.

Following out the same line of investigation, the effect of starvation on the "alkaline tide" was determined in three subjects. These cases received no food throughout the day until 5 p.m., but were given 200 c.c. of water at 9 a.m., 12 noon, and 2 p.m. to assure an adequate urinary output. In each of these cases the "alkaline tide" was practically absent. One of these subjects, who showed a normal reaction under standard conditions, and whose "alkaline tide" was absent when no food was taken, was starved on a second day until 12 noon, when he received his usual dinner. With this procedure there was no matutinal "alkaline tide" whatever, but he developed an unusually well-marked afternoon reaction, the pH swinging sharply at 2 o'clock to the alkaline side. On a third day he was starved until 2.30 p.m. without urinary reaction, when, following a meal at that hour, he developed a well-marked "alkaline tide" at 5 p.m. The results found in this case are of the greatest importance in the understanding of this subject and are found in Chart VI.

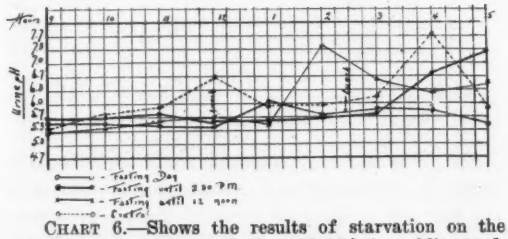

CHART 6.—Shows the results of starvation on the urinary reaction, the "alkaline tide" being obliterated. Also, two other curves are shown to demonstrate that a "tide" may be induced by a meal at any time during the day. The dotted curve represents the control day.

The reaction to histamine.—The effect of histamine on the gastric secretion in man was first investigated by Carnot, Koskowski and Libert[22] (1922) and by Matheson and Ammon[20] (1923). They demonstrated that the subcutaneous injection of a histamine base in small amount (0.5 mgm.), produced an increase in the amount of hydrochloric acid already secreted in subjects with normal gastric findings. In cases with achlorhydria, little or no increase in the total acidity resulted, while free acid failed to appear in the majority of such instances. The exceptions to this latter finding were in those cases in which no organic basis for the achlorhydria could be found, and in these the increase in acidity was not pronounced, although occasionally a small quantity of free acid developed. This work has since been substantiated by a number of others, and Dobson[21] has even divided the achlorhydrias into four groups according to the degree of gastric reaction. With this knowledge in mind, it was thought worth while to determine the effect of this gastric response upon the hydrogen ion concentration of the urine; i.e., to see if the increase in gastric acidity would result in the development of an "alkaline tide." The following technique was employed. On the test day the subject received no breakfast, but the gastric tube was passed at 9 a.m. and the fasting content removed, when an ordinary test meal was given. Specimens of 10 cc. each were withdrawn at fifteen minute intervals for an hour, at the end of which period all stomach contents were removed and the stomach washed out with water. A second similar test meal was given at once, and just as the subject finished this, 0.5 mgm. of histamine di-hydrochloride was injected subcutaneously, and the general reaction noted. In all cases this was typically present. Specimens of gastric contents of 10 cc. each were again withdrawn every fifteen minutes for an hour, but at the end of this period, instead of withdrawing the residue as in the first instance, only the single specimen was removed. A simultaneous hydrogen ion concentration test was carried out in the usual way throughout the day. The subject received dinner at the usual hour after the completion of the gastric analysis. A control test was done a day or so later, similar in every respect to the first except that the histamine was omitted.

This procedure was carried out in a series of twelve cases having relatively normal gastric findings. It was found in all but one case that shortly after the injection of the histamine a sharp well-marked "alkaline tide" developed,

swinging well to the alkaline side, reaching its maximum within the hour in nine of the eleven positive cases, and being prolonged well into the afternoon. In five of these cases the afternoon "tide" was merged with this reaction which was very marked, while in the remaining four, a slight afternoon "alkaline tide" was superimposed. These results are shown in Charts VII and VIII.

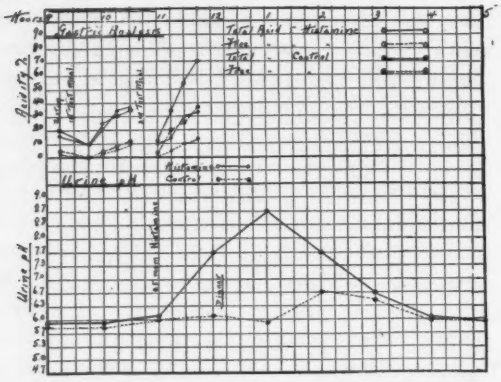

CHART 7.—Shows a relatively normal gastric acidity with marked increase in gastric acidity as a result of histamine, and a consequent well marked "alkaline tide" in the urine.

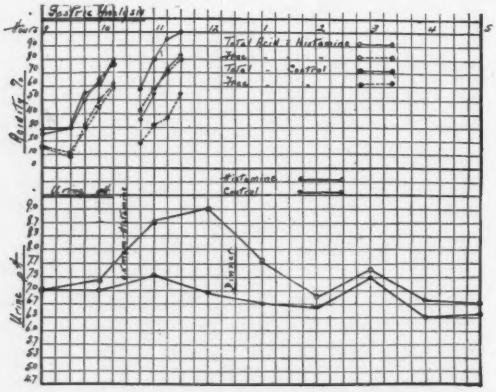

CHART 8.—Shows a case with a slight hyperacidity in which there was a well marked gastric response to histamine with corresponding reaction in the urine. In this case there is a slight superimposed "alkaline tide" in the afternoon on the histamine test day.

In most of these cases the urinary reaction swung back to the acid side in the late afternoon. But in two cases where the "alkaline tide" developed more slowly (reaching the maximum in from two to three hours), it lasted throughout the afternoon. In one case no immediate "alkaline tide" developed. In this patient there was low urinary acidity to start with, and it remained so throughout the day with a slight afternoon variation and showing no definite reaction to the histamine. On the control day the matutinal tide was practically absent and no change in the urinary reaction developed after the morning test meal although the usual reaction occurred after the noon meal.

The fluctuation in the urinary reaction coincident with the increased hydrochloric acid secretion, resulting from the injection of histamine, would appear to afford valuable additional evidence in support of the gastric origin of the "alkaline tide."

The same procedure was tried out in thirteen cases of achlorhydria of which six were diagnosed pernicious anæmia, five had carcinoma of the stomach, one carcinomatosis without apparent gastric involvement, and one had severe secondary anæmia. Analysis of the results in these cases shows that in all cases of pernicious anæmia only a slight increase in total gastric acidity occurred after histamine without the development of any free acid, and in all these cases an "alkaline tide" failed to develop in the urine (Chart IX).

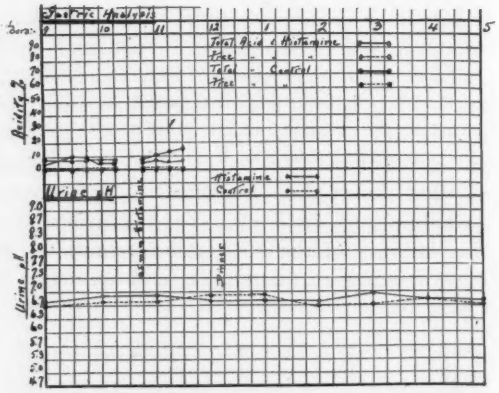

CHART 9.—Shows a typical case of achlorhydria in pernicious anæmia, in which histamine produced little or no change, either in the gastric or urinary acidity.

Of the cases of carcinoma, three, including the case of carcinomatosis, showed similar findings. In the remaining two cases of gastric carcinoma and in the case of secondary anæmia, there was a slightly higher total gastric acidity to commence with, but no free acid. These cases developed a marked increase in total acidity and some free hydrochloric, and with this there occurred a corresponding "alkaline tide." In Charts X and XI there are shown the results obtained in one of these cases of gastric car-

cinoma and the case of secondary anæmia. These findings, when contrasted with those of normal cases, would appear to afford almost conclusive evidence of the relationship between the secretion of hydrochloric acid in the stomach and the "alkaline tide" of the urine, in that when histamine is used as a stimulant to gastric secretion the change in the reaction of the urine is proportional to the gastric response in practically all instances.

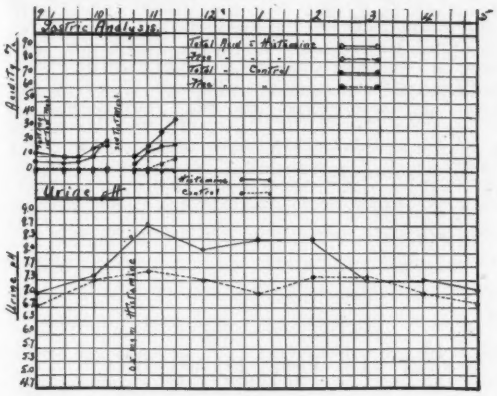

CHART 10.—Shows a case of achlorhydria in carcinoma of the stomach in which there was a well marked increase in gastric acidity as a result of histamine with a consequent "alkaline tide" in the urine.

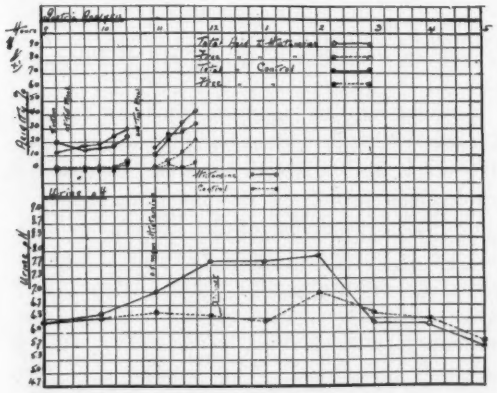

CHART 11.—Shows a case of achlorhydria in a case of secondary anæmia in which there was a well marked increased secretion of hydrochloric acid in the stomach as a result of histamine with a consequent "alkaline tide" in the urine.

Summary and Conclusions

1.—As has been shown by previous workers, individuals having a relatively normal gastric secretion, are prone to develop a less acid urine after meals, commonly referred to as the "alkaline tide," and these "tides" occur regularly after each meal, independently of other influences such as the increase in respiratory exchange, coincident with increased activity in the morning. The lowest urinary acidity occurs usually three hours after the meal.

2.—The relatively high acidity of the specimens at 9 a.m., 1 p.m., and 5 p.m. remains to be explained definitely.

3.—The degree of urinary acidity, in cases with relatively normal gastric acidity, appears to vary inversely with the amount of that acidity, both in different subjects and from day to day in the same subject.

4.—In hyperchlorhydria the pH of the urine throughout the day slowly tends to the alkaline side.

5.—In achlorhydria the "alkaline tide" is for the most part wanting, being present in only a small percentage of cases, in which the total gastric acidity is slightly higher than the others.

6.—Different types of diet as they exert different degrees of stimulus to the gastric secretion, consistently produce corresponding changes in the urinary reaction. A high carbohydrate and low protein diet is productive of little or no "alkaline tide," while a diet rich in protein results in the most conspicuous "tide."

7.—Starvation tends to eliminate the "alkaline tide" entirely, even though the patient receive some water during the day.

8.—A meal given at any time of the day will produce, in normal individuals, a change in the urinary reaction.

9.—Histamine, when given subcutaneously to an individual having a normal or high gastric acidity, increases this secretion and produces a well-marked "alkaline tide" in practically all instances. In cases of hypochlorhydria, and in certain cases of achlorhydria in which the secretion of hydrochloric acid is stimulated by histamine, there develops an "alkaline tide" where formerly there was none.

10.—In those cases of achlorhydria in which there is no gastric response to the histamine, the "alkaline tide" fails to develop, apparently due to the lack of response on the part of the gastric secretion. The absence of any change in the pH of the urine in these cases most conclusively rules out the possibility that the reaction in the other cases might be due to increased metabolic activity consequent to the histamine.

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11.—All of the above findings offer strong evidence in support of the gastric origin of the "alkaline tide," in that in practically all cases a definite relationship between gastric secretion and the pH of the urine has been demonstrated.

12.—The consistent relationship between the gastric acidity and the urinary reaction may have a practical application in those cases where it is impossible to examine the gastric contents directly, a fair conception of the secretory activity of the stomach may be obtained by means of the urinary pH curve based on hourly specimens.

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SIMPLICITY IN THE MANAGEMENT OF THE DIABETIC*

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THE combined data available from life assurance companies' statistics shows that the incidence of glycosuria is about two per cent. The fact that the average age of life assurance applicants corresponds to that at which the frequency of diabetes is greatest, may, as held by some authors, account to some extent for this incidence. An important counteracting factor, however, is that it was found in people, the great majority of whom were apparently healthy. Had the selection been of a more random nature, including the population as a whole, the true incidence would probably be still greater. Another factor to consider is that urine analysis is not yet a routine procedure in one hundred per cent. of physical examinations, nor are the technical methods of examination standardized. The data of one of these companies, which has its own laboratories, and in which the urines of all its applicants are examined by the same method and by the same laboratory workers, showed an incidence of glycosuria of three per cent.

It might here be suggested that the value of this observation is more apparent than real, since glycosuria and diabetes are not necessarily synonymous terms. I do not intend now to enter into a discussion of the glycosurias, non-diabetic in origin. That glycosuria may be caused by conditions other than diabetes, such as acute infections, emotional and nervous states, pregnancy, altered renal permeability, etc., is generally recognized. The incontestable fact, however, remains that the characteristic features of a group of individuals with glycosuria, observed for a long time are: the mortality rate is greater than in the normal, and the chief cause of death is diabetes. One large company found in such a group that the ratio of actual to expected deaths was over two hundred per cent. of the medico-actuarial standard. That is, the death rate at any particular age was more than twice the normal. More simply stated, this condition of affairs may be deduced. Of ten thou-

*Delivered before the Montreal Medico-Chirurgical Society, October 16th, 1925.

sand people at the age of forty, without glycosuria, only ninety-three die before they are forty-one years old. Of the same number of individuals, but with glycosuria, one hundred and eighty-six fail to reach their next birthday. Further, and very strongly suggestive evidence that the excess mortality was due to diabetes was the fact that, though high at first, the death rate returned to normal in about six years. It is interesting to note that this corresponded to the average duration of the disease at that time. In other words in this period of time the majority of individuals who had glycosuria of diabetic origin died. That the greatest number of those applicants alive at the end of six years are not diabetics is implied by the mortality ratings of these companies. The expectation of life for the group, as a whole, is greater than the average duration of the disease. On the basis of the above mortality rate of two hundred per cent., an individual with glycosuria at the age of forty, is assumed to be fifty-one years old. Even at this age, his expectation of life is approximately twenty years, that is, fourteen years more than the average duration of the disease.

This high mortality rate was noted before the days of insulin, but at a time when the results of treatment based upon the principle of undernutrition should have been felt. As late as 1921, at a meeting of the Association of Life Insurance Medical Directors, its President, Dr. Knight, showed that in a group of individuals, with glycosuria even on one occasion only, the ratio of actual to expected deaths was high at practically all ages.

Since the advent of insulin, the true death rate from diabetes has probably greatly decreased, though this is not evident from the last report of the United States Bureau of Census, (1922). This shows not only no improvement, but an actual increase in the "crude" death rate. Many factors must, however, be considered in the interpretation of "crude" data. At the Montreal General Hospital we were fortunate in having only three deaths in the wards in 1924. In all three cases the diabetes was complicated by infection, and in each case at the time of death there was no evidence of acidosis. Two had gangrene of the extremities, and one had a general peritonitis following appendicitis. Two other patients died at home; one of a pulmonary hæmorrhage due to tuberculosis, and the other of diabetic coma. The ages of all these patients were between forty and forty-five years. In view of the number of patients in our diabetic clinic, this corresponds to a death rate of approximately one per cent. per annum; that is, no more than would be expected from any group of individuals taken at random, but of the same age.

The treatment of diabetes may now be more satisfactory, and the mortality rate may have been lowered, but it is only by rigid adherence to treatment that such a state of affairs may be maintained. For the great majority of diabetics dietary regulation still remains the only necessary form of treatment, and it is with one particular phase of this that we shall deal now. I wish to report a method of education which has been followed at the Montreal General Hospital in a sufficiently large number of cases to test its value. It differs somewhat from that generally regarded as the "ideal," and, it is believed, has proven successful.

Successful treatment consists of rendering the urine of the diabetic sugar free, his blood sugar normal, and maintaining this state of affairs on a diet compatible with his energy requirements. For this purpose, as we all know, education of the patient is essential. The best system of education, however, is not that which yields *strikingly good* results in a small group of selected individuals, but that which yields the greatest number of *good* results in a large group of people taken at random.

For comparative purposes it will be necessary, at least briefly, to outline what represents the general conception of the "ideal" method. We shall not here discuss the management of the incipient diabetic, whose tolerance for carbohydrates is only slightly diminished. The urines of these individuals can readily be rendered sugar free by simply restricting excessive intake of carbohydrates and the total quantity of food. Simply eliminating sugar in the tea and coffee, avoiding candies, pastries, puddings, etc., and restricting bread intake to one slice per meal is usually successful in this type of case. These people do not require hospital treatment. We are now concerned with the diabetic whose tolerance for carbohydrates has been lowered to such a degree that he requires some knowledge of the composition of food materials.

Under the "ideal" system while the patient

is in the hospital he is taught the elementary ideas of diabetes, urine analysis, and the construction and calculation of diets with the use of scales and other measuring apparatus. With the necessary paraphernalia, and the education just described, he leaves the hospital, and is then expected to keep his urine sugar free, the blood sugar normal and otherwise well. The one great fact impressed upon the patient is that he must weigh the food and measure the fluids *accurately* in order to keep within his limits of tolerance. This fact is still more strongly impressed when insulin is employed in the treatment.

What may be regarded as "ideal" is not necessarily the most practical, and therefore the most successful. It need hardly be remarked that for a large group of people of random selection the most practical form of treatment will be the most successful. It may be a compliment to the human race, but it is unfortunately undeserving, and may at times be dangerous, to assume that all diabetics are sufficiently intelligent to master the "ideal" method of education just described. Allowing a mental capacity of such high order, there remain other disturbing factors. One—and very important in a metropolitan city—is the foreign population. As a matter of fact about thirty per cent. of the total number of diabetics in the clinic at the Montreal General Hospital belong to this group. Discounting this, there is another and still greater factor, namely the impracticability of the use of scales, and it is this problem particularly that I wish to discuss.

Excluding the disease itself, diabetics differ in no way from other individuals of the same age, sex, occupation, mentality or position in society. It is hardly necessary to enumerate the many instances in which the use of scales may be cumbersome. It is important to recognize this fact. *The averaged individual will follow a prescribed diet only in direct proportion to the simplicity with which it can be constructed.* It may be possible that the experience at our clinic has been unfortunate, but the fact remains that of ten individuals taken at random, one cannot and two will not use scales. Four may do so for a short time, but eventually give it up. One does so for the enjoyment of it, and two would, but find it incompatible with their daily duties. In our clinic sixteen physicians belong to the latter group. Does this mean that the health of the majority of this group of people—and it represents a no mean number—is to be left to chance? I wish to demonstrate that, contrary to the general conception, the management of the diabetic, without the use of scales, but with proper instruction, can be as thorough and as scientific (probably more) and yield, at least, identical results as that with the use of scales.

There are now over five hundred patients in this clinic who do not use, and never have been taught the use of, scales. They represent the type of diabetic whose tolerance for carbohydrates is sufficiently low to necessitate the consideration of food values. From an investigation of the progress of these individuals and our mortality data, we have reason to believe that this method of treatment is successful.

If the results of approximated diets are found, at least, to parallel those of weighed diets, it seems that both types of diet must have been constructed with equal degrees of accuracy. This may at first appear paradoxical. That they are so constructed becomes evident from the following considerations.

From a superficial analysis only, one is generally impressed with the degree of accuracy with which the various procedures in the treatment of diabetes are carried out. It will now be necessary to briefly consider this factor of accuracy, because it is only by the results of such a study that the practice followed in this clinic can be shown to be possible. Evidence of the extreme degree of accuracy with which we think we do our work is frequently found in the literature. "The patient was progressing favourably until one day when an extra few grams of carbohydrate or fat were taken. Glycosuria then reappeared." Statements to this effect are frequently met with. The use of the first decimal point in the construction of food value tables for patients, and in the calculation of diets is further evidence of the assumed degree of accuracy. Let us now search for a possible fallacy of this assumption. It will be necessary to briefly consider the subject of experimental errors.

The most careful measurements, even in the domain of the exact sciences, astronomy, physics and chemistry, etc., where methods of

measurement approximate perfection as closely as possible, are always liable to error. None is exact. At best, they are a very close approximation of the truth. The chief errors are, firstly, "constant" and due to imperfections in the apparatus employed, and secondly, "accidental" errors of observation, inherent in the observer. Besides these, and apropos of the present discussion, *discrepancies may result from the inherent variability of the object measured.* An important thing to recognize is the degree of this error, because it is a waste of time and labour to calculate the results of experiments to a degree of accuracy beyond which it is possible to perform them. For example, to insist upon the use of a millimeter scale, implies that the object to be measured can be measured within a millimeter. To state that an object weighs 10.564325 grams implies that the balance employed in the measurement of this object is sensitive to one-thousandth of a milligram. If the balance is only sensitive to one-tenth of one milligram, the result so expressed is not only evidence of a waste of time and labour, but is, to say the least, unscientific. Calculating results beyond the limits within which it is possible to obtain them experimentally, does not increase the accuracy of such results.

These few remarks have a particular application to food studies. For practical purposes, "constant" errors and those due to observations may be regarded as negligible owing to the gross manner in which food is used. The chief discrepancies which result are due to the inherent variability of the metabolism of the individual and the composition of food materials. Some of these will now be demonstrated.

In Table I is recorded a diet of a diabetic. It consists of ordinary food materials, and was constructed in the strictly orthodox manner.

TABLE I.

Breakfast:	50 gms.	orange.
	50 "	egg.
	25 "	bacon.
	20 "	butter.
	25 "	bread.
	50 "	cream.
	250 cc.	tea.
Lunch:	100 gms.	beef (loin).
	25 "	potato.
	200 "	cauliflower.
	25 "	bread.
	20 "	butter.
	25 "	cream.
	50 "	apple.
	200 cc.	tea.
Dinner:	50 gms.	salmon.
	Salad:	50 gms. tomato.
		50 cucumber.
		25 lettuce.
	25 gms.	bread.
	20 "	butter.
	50 "	cream.
	250 cc.	coffee.

The Atwater-Bryant Food Tables show that the variations in the fat and protein content are as follows:

COH.	*Fat*	*Prot.*
52	104	32
86	129	52

It may thus contain fifty-two grams of carbohydrate. On the other hand it may contain eighty-six grams of carbohydrate. The possible variations in the fat and protein content are as remarkable. In the next table (Table 2) are reproduced from the Atwater-Bryant Food Tables, in alphabetical order, a list of twenty-one of the commonly used vegetables and their percentage carbohydrate contents.

TABLE II.

Vegetable	*max.*	*min.*	*avge.*	*range*	*Number of analyses*
Asparagus.....	3.6	3.1	3.3	0.5	3
Beans.....	63.5	57.2	59.6	9.3	11
Beets (fresh)...	16.3	3.8	9.7	12.5	24
Cabbage.....	8.0	3.4	5.6	4.6	15
Carrots.....	13.8	6.5	9.3	7.3	18
Cauliflower....	6.0	3.4	4.7	2.6	2
Celery.....	4.6	3.0	3.3	1.6	5
Green corn.....	22.6	14.1	19.7	8.5	3
Cucumbers....	4.0	2.2	3.1	1.8	4
Lettuce.....	4.9	1.6	2.9	3.3	8
Mushrooms....	20.3	2.4	6.8	17.9	11
Onions.....	15.5	4.2	9.9	11.3	15
Parsnips.....	16.7	8.5	13.5	8.2	3
Green peas.....	18.9	13.4	16.9	5.5	5
Potato.....	27.4	13.5	18.4	13.9	136
Radish.....	8.3	3.4	5.8	4.9	4
Rhubarb.....	4.4	2.9	3.6	1.5	2
Spinach.....	3.4	3.1	3.2	0.3	3
Squash.....	16.1	3.5	9.0	12.6	10
Tomato.....	6.5	2.2	3.9	4.3	27
Turnip.....	23.8	2.8	8.1	21.8	19

In the first three columns are recorded, in order, the maximum, minimum and average values. Since these are listed in terms of grams of carbohydrate per one hundred grams of vegetable, and since this represents an average serving per meal, the possible variations in the quantities of carbohydrate ingested at a single meal may readily be seen. The maximum-minimum range is shown in Column 4. Such possible variations may also be noted amongst the fruits, and, for the sake of brevity, will not be shown. Analysis of the fat and protein contents of the animal foods (meats, fish, etc.) shows

that five to ten gram variations in the average amount taken at a meal may be a common occurrence. In other words, it seems that an individual may consume fifteen to twenty grams of protein per day above or below the calculated (assumed) intake.

The objection might here be made that I have demonstrated extreme values, and that the diet of the diabetic is calculated, not on the basis of maximum nor minimum, but upon average values. This objection may be met with in at least two ways. Firstly, the average values employed, with few exceptions, have a very limited significance, for the simple reason, that the series of observations from which they have been calculated are too small. The average value of a physical measurement represents the most probable value *only* in the case of a large series of determinations. That appreciation of this fact is necessary in the use of food tables is implied in the introductory remarks of the Atwater-Bryant publication from which we obtain most of our values. The intention of this publication, to quote verbatim, was "to give the maximum, minimum and average of all available analyses." Only in those cases where the number of analyses of a single product was considerable, such as milk, butter, etc., was it suggested that the "averages which are given in the tables may be used advantageously in computing the composition of foods used in dietary studies." This fact appears to have been overlooked. From a small series of determinations, maximum, minimum and average values may be used, but before doing so it is necessary to "weight" the data. As far as I could ascertain from the literature, this has never been practiced in the management of the diabetic diet.

I have taken one hundred diets from our hospital records and obtained their maximum and minimum values. The selection of the diets was random, except for their supposed uniformity in composition of carbohydrate, protein and fat. Each diet was supposed to contain fifty grams of carbohydrate, one hundred and fifty grams of fat, and fifty grams of protein. It might be assumed that if one article of diet showed a large variation in composition in one direction, another in the same diet might show an equal degree of variation in the opposite direction. Such assumption may be based upon the fact that the diets were prepared by the dietitian with no particular selection of articles as to their variability. Therefore the actual carbohydrate, protein and fat contents would closely approximate those assumed. The following table shows the results of this study. In the first column are recorded the variations in the total glucose content per day; that is, the total glucose available in all the carbohydrates, fats and protein —(Grams G =C+0.1 F+0.58P). In the second column is recorded the incidence of such variations.

Variations gms. glucose per day	*Incidence*
61–70	2
71–80	24
81–90	20
91–100	6
101–110	41
111–120	6
121–130	1

This table demonstrated the chief error with which we are concerned in the constructing of diets, namely, the inherent variability of the object we are trying to measure. A first glance at this table might tend to create the impression that diets cannot be measured at all, with any degree of accuracy. Such an impression would be dangerous, for without measured diets the treatment of diabetes to-day would be in the state it was in fifteen years ago. My object in presenting the results of this study was, obviously, not to decry the use of measured diets, but to demonstrate the degree of accuracy with which diets can be measured, and the practical application of such a study.

The average values found in food tables may, in many instances, have limited significance. But the maximum and minimum values are important. With these it is possible to determine the degree of accuracy of our work. One of the purposes of modern statistical methods is to discover the most probable value, out of a series of discordant results, such as I have demonstrated. I do not intend to elaborate upon the details of this procedure. It can be shown, to state it mathematically, that in this study the arithmetical mean value of the total available glucose was ninety-four grams and the standard deviation was fifteen. More simply stated, in the majority of cases these patients were receiving somewhere between seventy-nine and one hundred and nine grams of glucose, in spite of the fact that the food was very accurately

weighed and supposed to contain ninety-four grams.

Once we were convinced that in spite of very careful measurements diets are not prepared with the degree of accuracy generally supposed, and the actual degree of accuracy was known, it was now only necessary to determine within what limits of error it is possible to teach patients to approximate the weights of the various food materials. If this value were known, it would then be possible to calculate the combined error due to the variability of food composition and to approximation of weights. The value of such a study will presently be noted.

For this purpose a uniform method of education was adopted, and has now been in practice for approximately five years. The general underlying principle is uniformity in dimensions for uniformity in weights. A few examples might here be mentioned. One piece of butter, one inch square and and half-inch thick weighs about ten grams. This is the unit for butter. If the diet contains twenty grams of butter, two pieces, each having the above dimensions are served. One piece of bread two inches square and one half-inch thick weighs about ten grams. This is the unit for bread. If the diet contains thirty grams of bread, three separate portions, each having the above dimensions, are served. The textures of the various breads are such that the greater number will weigh slightly less. Six teaspoons of a certain size deliver one ounce of fluid. Vegetables are always served in one hundred gram portions. Portions of meat or fish of equal weight are cut in uniform dimensions, the latter obviously depending upon the particular type.

The average time spent by our diabetics in the hospital is about two weeks. During this time, while the elementary ideas of diabetes, food values and urinalyses are taught, the patient may see these food units, just described, served thirty or forty times. Under this set of conditions the average child of over ten years of age can be taught to approximate the weights of the articles of diet for the day with an average error of less than fifteen per cent. To be on the safe side, an error of fifteen per cent. is assumed. When this is allowed for, the combined error may be calculated. It can be shown by the laws of probability, that the increase in error due to approximation of weights is about six per cent. More simply stated, when the average patient is properly trained to approximate food weights, he may take on this diet of ninety-four grams of available glucose, somewhere between only six grams more or six grams less glucose than allowed. This includes the total glucose available from carbohydrate, fat and protein. If the error due to approximating weights were even twenty per cent., the difference would be about eight grams.

This system of education represents an enormous amount of extra work on the part of the dietetic staff. As first stated, should the patient receive two hundred grams of vegetable of the same kind, this same vegetable must be served in two separate portions of one hundred grams each. Portions of butter must be cut uniform in size, etc. Our dietitians, Miss Perry, Miss Jamieson, and their staff of assistants, are, however, sufficiently interested in their work and results to overcome this difficulty.

The diets are further made more practical by consisting of simple articles of food, such as milk, eggs, cream, meats, fruits, and vegetables in season. With the exception of bran muffins and Jello, for filling purposes, no special diabetic food products are employed. The diets are also so constructed as to conform to the regular habits of the individual. Most of our diabetics are not accustomed to, and, therefore, do not receive vegetables for breakfast. An average diet for the day is as follows:

Breakfast:	Grapefruit or orange. Bacon or eggs or both. Bran muffins with butter. Tea or coffee with cream.
Lunch:	Clear broth. Meat or fish. Vegetables. Bran muffins with butter as at breakfast. Tea or coffee with cream.
Dinner:	Same as lunch, substituting the various meats, fish and vegetables.

The actual quantities in each case, obviously, depend upon the requirements of the individual.

The possible calculated error may be further reduced by using those foods which show the least variation in maximum-minimum values. With few exceptions, the five per cent. vegetables are employed. Lean meats and fish are used, fat being obtained from foods of more uniform composition, such as butter, etc.

My object was to attempt to demonstrate that with this system of education the diabetic may

follow a diet which is more practical than the one generally employed. The clinical results alone are proof of this. It is interesting, however, to know that the principles upon which it is based are scientific. Those few individuals who have both the time and inclination to use scales do so. This method of management, just described, is meant to apply to those individuals who, by far, in our experience, represent the great majority of diabetics.

BASAL BLOOD PRESSURE*

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SINCE 1887 when the work of Von Basch and Riva Rocci made the clinical estimation of human blood pressure simple and accurate, no diagnostic procedure has received so much attention from physicians; many volumes and essays in thousands have been written upon its various phases. In spite of this extensive exploitation there are still parts of it that will bear reconsideration and emphasis.

Every department of medicine has at some time suffered from too much pathology and not enough physiology, so that normal and innocuous conditions have been regarded as being abnormal and dangerous. The classical example of this is seen in the interpretation of systolic murmurs; these were usually regarded as definite evidence of disease until the modern school of cardiologists, of which the late Sir James MacKenzie was the originator, proved that they may be in themselves without clinical significance. A less striking example is afforded by modern work on kidney and pancreas function which has shown that glycosuria and albuminuria, once regarded as invariable signs of pathology, are frequently quite harmless. Also in considering pulmonary tuberculosis we find that not long ago a diagnosis was made on signs that are now generally conceded to be quite compatible with normal function. Many other examples of the degradation of physiology to the level of pathology could be cited. In face of this evidence, it would appear profitable to enquire occasionally whether or not we are still committing depredations on the preserves of the physiologist to the unnecessary alarm of our patients and the advancement of useless remedies and quack practitioners.

As a preliminary to such an enquiry it is necessary to consider what variations in blood pressure may be expected in a normal individual. These variations will be found to be more profound, more sudden and more frequent than is generally realized. Systolic blood pressure indeed is an exceedingly sensitive indicator, which under physiological conditions meets every environmental change with an immediate and adequate adjustment. The conditions that most commonly play upon the blood pressure are changes of posture, digestive activity, physical exertion and emotional excitement. Each of these will be considered separately.

Common Physiological Variations.—On changing from the recumbent to the erect position, one would expect an increase in systolic pressure and in pulse pressure in order to meet the much increased demand upon the heart. The fact that neither of these changes usually occurs shows the futility of theorizing upon the mechanism of the cardio-vascular system. In practice it is found that on assuming the upright position, the pulse pressure is invariably reduced. This is affected by:—(1) A pure fall in systolic; or (2) a pure rise in diastolic; or (3) these two combined; or (4) a slight rise in systolic with a greater rise in diastolic. In about seventy-five per cent. of normal people, the systolic pressure falls; this fall may be quite a considerable item, sometimes amounting to ten or fifteen mm. of Hg. It is often much more in those with hypertension. The presence of this postural variation in blood pressure proves the necessity of adopting a standard posture in mak-

*Read before the Winnipeg Medical Society, March 27, 1925.

ing our readings if it is intended that they are to be comparable with one another.

From theoretical considerations it might be predicted and by actual observation it may be proved that the level of the brachial artery in relation to that of the heart affects the pressure in the artery. This is purely on account of the effect of gravity. Since the specific gravity of mercury is about thirteen and that of blood is about one, every centimetre elevation of the arm produces nearly a millimetre difference in the mercury manometer. Practically this works out to a fall of pressure in the brachial amounting to about 15 mm. of Hg., as the arm is raised from the side to the horizontal position. It follows that a similar position of the arm in all observations is necessary if parallel readings are required.

Changes in *blood pressure consequent to emotional states* are frequently profound. The degree of such changes in very deep emotional states, such as great fear or anger, is not easy to estimate and fortunately does not come into the scope of this communication. It is necessary only to consider to what extent this variation may affect our daily practice. It may easily be demonstrated that it plays a most important rôle. The comparatively slight emotion produced by ordinary history taking, and a simple examination, may induce great changes in blood pressure. I have seen a case in whom the blood pressure rose from 135 to 195 in the course of five minutes while a sad past history was being detailed. In the ordinary individual, the psychic stimulus consequent on having the blood pressure taken always produces a definite rise varying with the sensitiveness of the patient. The amount of this variation may be readily shown in any given case by repeated observations at short intervals while the patient is recumbent and silent. It will then be seen that the pressure gradually drops as the patient becomes accustomed to the procedure but will not reach a steady level for fifteen minutes or more. The extent of this fall varies from 5 mm. of Hg. in phlegmatic people to as much as 50 mm. in those who are sensitive.

Ordinary exertion in normal people causes a rise of blood pressure which is, roughly, in direct proportion to the amount of strain. The effect of taking off clothes and climbing on to the examination table will cause a considerable rise in flabby individuals. *Digestion* and *smoking* also cause increase in blood pressure and these influences must sometimes be taken into account. Their extent varies with the quantity and quality of the food, drink, and tobacco, and with the constitution of the patient. That they may be considerable is illustrated by the chart.

I have studied normal individuals with the hope that the extent and type of physiological variations might be demonstrated. Chart 1 shows the variation in systolic and diastolic blood pressure and in pulse rate in a healthy medical student in response to change of posture, digestion, and the activity incidental to a day of sedentary work. The first three observations were taken before he arose in the morning, and were as indicated. Throughout the day care was taken to eliminate any unusual conditions such as, violent exertion, excessive smoking, heavy meals and stimulants. From an inspection of this chart it will be seen that the systolic blood pressure under quite ordinary conditions varied from 105 to 135. The variations seen are what might be expected in any healthy person during a quiet day. Similar charts have been produced from many other subjects.

Chart 2 shows the blood pressure response to emotion in a sensitive individual. The systolic blood pressure will be seen to fall from 170 to 140 in the first twenty minutes during which time the patient was encouraged to relax and to remain silent. A subject of conversation with a high emotional content was then introduced, with the result that the systolic pressure again rose to nearly 170. This response could be induced with apparently the same intensity repeatedly. It can indeed be demonstrated in varying degrees upon any individual.

Misinterpretation of physiological variations.—These being the common normal variations, it remains to inquire whether or not they suffer from neglect or misunderstanding. Even casual consideration of the literature convinces one that such neglect does take place. I wish to cite two examples. In July, 1923, W. C. Alvarez, of California University, published findings and conclusions on blood pressure observations made upon 14,934 first-year university students. In this communication it is stated:—"The mode for all the men was 124.7 mm. of Hg. and for all the women was 114.6. These figures we believe represent the only standards." These figures no

doubt, represent useful standards but their value in comparing the average blood pressure in men and women is entirely vitiated by the fact(which appears in a foot-note earlier in the paper) that the blood pressure of the women was taken in the erect posture and that of the men in recumbency. This alone would account for a large part of the difference between the two figures. In this case, disregard of the postural variations, has robbed an excellent piece of work of much force. In June, 1923, D. C. Kinney published in the *Journal of the American Medical Association*, a paper in which he described cases which showed what was called, "A complete reversal of the normal blood pressure reaction." This so-called reversal consisted in a fall of blood pressure on assuming the upright posture. This, as we have seen, is actually the usual normal reaction and one fails to join the writer in his amazement when he says "Strangely enough out of the next seventeen cases of cardio-vascular renal diseases examined, twelve showed this reversal of blood pressure."

Examples showing the disregard for physiological variations are common in daily practice. Cases are frequently seen in connection with life insurance. A man aged thirty, applies for insurance and in the midst of a busy day, perhaps after a good lunch, rushes up to the doctor's office, and while smoking a cigarette has his blood pressure taken in recumbency; one reading is taken, and because it is 150 he is refused insurance. It is suggested that a blood-pressure of 150 or even more under these circumstances may be quite normal, and repeated observations during fifteen minutes would probably show a reduction of 25 or 30 mm. of Hg. as the patient recovered from the effects of exertion, smoking, and slight apprehension, or mere interest arising out of having his blood pressure taken.

Many therapeutic procedures have gained unwarranted reputations as blood pressure reducers because due allowance has not been made for natural variations. The tendency in the case of a patient who has a large emotional response in blood pressure is for the readings to become lower with each visit of the physician, as she comes to regard these visits with less alarm. This natural reduction is often ascribed to whatever measures may have been recommended. The reputation of potassium iodide and abstinence from salt and meat were probably largely made in this way and have been shown to be fictitious.

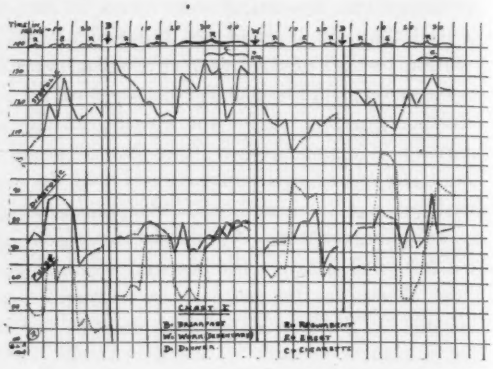

CHART 1.—Showing some variations in blood pressure in a normal individual during a quiet day.

Physiological increase in pulse pressure has often led to the erroneous diagnosis of hyperthyroidism. Increase in pulse pressure is a most valuable clinical indication. One can definitely say that there are practically no organic conditions except aortic regurgitation, arteriosclerosis, profound anæmia and hyperthyroid conditions that will produce a pulse pressure of over fifty-five. But to these organic conditions must be added functional or physiological increases. Cases due to such variations outnumber all the others combined. They are common because the increase of systolic blood pressure in response to emotion is not accompanied by a proportionate increase in diastolic pressure. (This is well illustrated in Chart 2). The consequent increase in pulse pressure cannot be confused with one due to aortic regurgitation, pro-

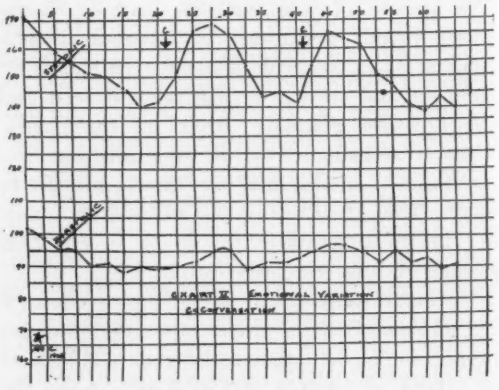

CHART 2.—Showing the variation in blood pressure consequent on emotional changes.

found anæmia or arterio-sclerosis because these conditions are easily spotted by other signs. It is, however, readily mistaken for that which is invariably associated with Graves' disease and toxic goitre, especially when it is accompanied by nervousness and tachycardia as is frequently the case. If the trouble is taken to eliminate all emotional increase in blood pressure and the consequent high pulse pressure the confusion is dispelled.

The group of cases in which emotional variations seem to be most commonly underestimated is that called hyperpiesis or essential hypertension. It is submitted as a possibility that a large percentage of patients with this diagnosis are simply sensitive and nervous people who have no cardio-vascular disease and whose blood pressure is normal throughout most of the day. A woman approaching the menopause commonly has headache, palpitation, flushings, faintness, etc.; in consultation over the tea cups she finds that her symptoms correspond with those of a friend who is being treated for "blood-pressure." She knows of people who have died of "blood pressure;" she worries and loses sleep for some time and then presents herself to a doctor in a state of great anxiety; he finds her blood pressure on one reading to be 170 and confirms her most awful fears by acquiescing in her home-made diagnosis; she then embarks on a life of diet, pills and visions of apoplexy. It is a melancholy but a legitimate assumption that had such a lady consulted a quack she would have been rubbed and reassured and would have improved. Most of such cases will give blood pressure readings well within normal limits if an effort is made to eliminate those physiological conditions that are known to cause an increase. In this respect they differ from true hypertension. The obvious objection to the suggestion that such temporarily increased blood pressure should be regarded as entirely physiological is that in so doing we may be ignoring the very thing we most wish to find, that is, the beginning of disease. This is a legitimate objection and it is quite possible that the women who to-day show hypertension only under excitement may be the women who will have true permanent hypertension a few years hence. Even if this is so, is it right to regard and treat them as cases of cardio-vascular disease and tell them that they have abnormal blood pressure? All their other symptoms point to the nervous system as the source of their trouble and it would appear most reasonable to treat them as neurological cases. The suggestion that they have disease of the heart or blood vessels will undoubtedly increase their nervousness and their hypertension.

The means by which such misinterpretation might be obviated.—All of the difficulties enumerated could be to a large degree obviated by a greater respect for physiological changes. Blood pressure is analogous to the metabolic rate in its variations. No one could give an opinion as to the significance of the metabolic rate unless it were taken under basal conditions; similarly we should not give an opinion on the significance of blood pressure findings unless they are taken under conditions in which factors that may cause physiological variations have been eliminated. A blood pressure observation taken under such conditions might be properly termed *Basal Blood Pressure.*

The basal blood pressure as a rule can be procured with much less elaborate preparation than is necessary to get a basal metabolic rate. The effect of digestion is probably inappreciable an hour or two after taking an ordinary meal, so that a long period of fasting is not necessary. The effect of ordinary exertion seems to pass off after lying down for fifteen minutes or even less. The adoption of the recumbent supine position as the standard eliminates variation due to posture. The effect of the mental and psychical stimulation can only be overcome by repeating the procedure so frequently that it becomes commonplace to the patient. To do this it may be necessary to take a series of observations on several separate occasions. It is to be remembered that the pressure may be prevented from dropping to its basal level by anything that arouses curiosity, fear, or even interest in the patient, such as conversation, examination of other parts of the body, or sometimes the intrusion of a third party. It may be assumed that the basal level is reached when several successive readings show no further fall. The ideal way in which to get the basal pressure is by taking half a dozen or more readings on three successive days before the patient gets up or has breakfast. In people who are not particularly nervous, the basal level is probably reached after lying for fifteen minutes in the physician's

examining room, during which time several observations are made.

If an effort were made to get something at least approaching the basal level in all cases where the blood pressure was considered of clinical significance several points would be gained; sensitive and high strung people would not be condemned to a life dedicated to the treatment of alleged cardio-vascular disease; the significance of large emotional variations would be learned and we would be able to distinguish physiological from pathological conditions; dependable, normal standards would be established and perhaps earlier actual variations from the normal would be discovered.

PYELITIS MANIFESTING ACUTE ABDOMINAL SYMPTOMS

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PYELITIS is a condition which manifests itself in many ways and often closely simulates other diseases, more especially acute appendicitis and other abdominal conditions. The surgeon therefore must be constantly upon his guard to detect its presence, otherwise he may make some bad blunders. In an endeavour to ascertain the difficulties and to point out some of the possible dangers, a review was made of all the cases treated in the Holy Cross Hospital, Calgary, and the Calgary General Hospital, during a period of one year. Forty-three cases under thirty different attending physicians were selected for this study, which included all the cases diagnosed as pyelitis and some abdominal conditions which later turned out to be due to pyelitis. In this study were included some cases of pyelo-nephritis, for in most instances it is impossible to distinguish between these two conditions. Secondary cases following operations, obstructive conditions of the genito-urinary tract or calculi were excluded. In these forty-three cases, thirty-seven occurred in females and six in males; the age incidence varied from six months to fifty-nine years. In regard to the etiology, the following observations were made. It was found that six cases suffered from pyorrhœa, six had recently recovered from influenza, two from scarlet fever, two from tonsillitis and two from gonorrhœa. The diagnosis was based on cystoscopic examination in twenty-five cases. In the others, the diagnosis was based on symptoms and urinary findings.

Bacteriological examination of the urine was made in sixteen cases. In fourteen, the causative organism was the *B. coli*, and in two, a staphylococcus.

These cases fall into four groups:—(1) Children, six cases; (2) complicating pregnancy, six cases; (3) chronic and sub-acute, eighteen cases; (4) acute, thirteen cases.

1.—*Children.*—These all presented high temteratures, from 102° to 104°, with corresponding increase of the pulse rate. They presented very few general symptoms and a total absence of any urinary symptoms. Two had vague abdominal pain and one had tenderness over one kidney. They all had pus in the urine. A point to be noted is that in all acute febrile conditions in children the urine should be examined, and the possibility of pyelitis kept in mind, as children rarely complain of definite urinary symptoms.

2.—*Complicating pregnancy.*—These did not present any great difficulty; perhaps because the attending physician is more impressed with the possibility of its occurrence. They all had urinary symptoms and they all had pus in the urine. Five had pain in the loin or abdomen, and four had a temperature as high as 102° F. Two vomited and one had a leucocytosis of 20,000.

3.—*Chronic and sub-acute cases.*—These were also easily diagnosed. All had urinary symptoms and all had pus in the urine. The attention was thus drawn to the genito-urinary system. It became merely a matter of proper and

exhaustive examination of the urinary tract to establish the correct diagnosis.

4.—*Acute cases.*—These are the class of cases which usually present some difficulty and may easily be mistaken for other acute abdominal conditions. It was for the purpose of emphasizing the possibility of making this mistake that this study was made.

There were thirteen acute cases in this series, two on the left side and eleven on the right side. This difference as to sides, probably arose from the fact that left sided cases are more easily diagnosed and are not so often sent to the hospital. Pyelitis probably occurs with equal frequency on the two sides. The temperature ranged from 100° F. to 103° F. and the pulse rate from 100 to 140; the leucocyte count from 5,000 to 25,000. They all had abdominal pain of some nature; only five were reported to have had pain in the back, and five to have been tender over the kidneys. No note was made in regard to these points in several cases so I think it may be assumed that a careful examination was not always made. In nine cases it was definitely noted that no urinary symptoms were present. In three there was frequency and in one no note was made. Eleven cases had pus in the urine and in two there was at first no pus but it appeared later. Three cases had a chill. Several had tenderness and muscular rigidity in the lower abdomen of the affected side. It is extremely difficult and sometimes impossible to distinguish these cases from an acute appendicitis. Urinary symptoms as stated above, are usually absent, and pus in the urine may not be present in the early stages. Pain, tenderness and muscular rigidity may be present. The presence of a chill, with tenderness and muscular rigidity not corresponding to the rapid pulse, and high temperature, and the tenderness which may generally be noted over the kidney, may be points of differentiation; but in all suspected cases of acute appendicitis this condition must be kept in mind, and where doubt exists a cystoscopic examination should be made. A brief outline of these acute cases is given for they well illustrate some of these points.

(a) *Left sided cases.*—There were two of this nature and because of their situation they were easily recognized.

Female, age thirty. Influenza one year ago. Was taken ill with severe abdominal pain in the left lower quadrant. Temperature 101° F., pulse 106. Considerable tenderness but no urinary symptoms. Pus was present in the urine and thus the diagnosis was easily established.

Female, age twenty-six. Three days before entrance developed severe pain in the left side of the abdomen and back. Vomited. Had a chill followed by high fever. Pain very severe but eased by drawing up the legs. Tenderness over the left kidney and the left lower quadrant of the abdomen. Leucocytic count 20,000; 88 per cent. polymorphonuclears. Some frequency with pus in the urine.

(b) Three cases presented symptoms very similar to appendicitis but were correctly diagnosed.

Female, age twenty-four. While out walking was suddenly taken with severe right sided abdominal pain, most marked in the appendix region where there was also marked tenderness. Temperature 101° F., pulse 100. Leucocytes 25,000. This case was first diagnosed as appendicitis and sent to the hospital for operation. Pus was discovered in the urine; a more careful examination was made and the diagnosis changed. She ran fever for two weeks with pus in the urine but this eventually cleared up.

Female, age twenty-four. Two days previously had a chill and high fever. Pain in the back and lower abdomen but not severe; some tenderness over the appendix. No urinary symptoms but pus was present in the urine. Temperature 103° F., pulse 120. Leucocytes 5,200. Diagnosed and treated as pyelitis.

Female, age fifty-two. History of several attacks of right sided abdominal pain. Present attack began several days earlier with severe right sided abdominal pain. Vomited and had a chill. Temperature 101° F., pulse 88. No urinary symptoms. This case came in from the country with a diagnosis of either acute gall bladder trouble or appendicitis. Pus in the urine and tenderness over the right kidney established the correct diagnosis. Cystoscopic examination showed purulent urine coming from the right ureter.

(c) Four cases were operated upon for appendicitis without finding an inflamed appendix and the subsequent course indicated the condition to be due to a pyelitis.

Female, age twenty-one. Influenza a short time previously. Pain in the right side of the abdomen for three days. Vomited. Temperature 102° F., pulse 124. Leucocytes 22,00; 84 per cent. polymorphonuclears. Tenderness over the appendix but no muscular rigidity. No urinary symptoms and no pus in the urine. Appendix was removed but was not much inflamed. Next day the temperature was high and continued elevated for two weeks. Pus and blood appeared in the urine and remained in considerable amounts. The wound healed normally.

Female, age forty. Influenza a few months previously. Twenty-four hours before admission was taken with sudden severe right sided abdominal pain, so that she could hardly walk. Vomited. Pain extended around to the lumbar region and down to the groin. Temperature 100° F., pulse 94. Tenderness over region of appendix and also in the lumbar region. No muscular rigidity and no urinary symptoms. Leucocytes 21,400 and 88 per cent. polymorphonuclears. A few pus cells in the urine. Appendix was removed and was found to be congested. Next day temperature was still high, and remained irregular for three weeks; and the urine contained pus.

Female, age seven. Twenty hours before admission had sudden severe right sided abdominal pain and vomited. Temperature 100° F., pulse 110. Leucocytes

13,200, 72 per cent polymorphs. Tenderness over the right lower quadrant, and by rectum. No urinary symptoms. A few leucocytes in the urine. The appendix was removed but was only very slightly inflamed. She made a good recovery but after leaving the hospital had two exactly similar attacks.

Male, age forty. Sudden severe pain in the right side of the abdomen. Temperature and pulse slightly increased. Leucocytes 24,000. No urinary symptoms and no pus in the urine. Appendix was removed; it was not much inflamed. A few days later he had pus and blood in the urine and a renewal of his pain and other symptoms.

These cases well illustrate the care necessary in the diagnosis of right sided pain. They all presented a very similar picture to appendicitis. A careful history and a careful examination of the kidney region and the urine in all cases will prevent many similar mistakes.

(d) In four cases there was fairly definite evidence of both pyelitis and appendicitis being present, for both conditions may occur simultaneously.

Female, age twenty-four. Influenza one year ago. Pain in the back and right side. Tenderness over right kidney and also over region of appendix with some muscular rigidity. Temperature 100° F. Some frequency and pus in the urine. Appendix was removed and found to be kinked and considerably inflamed. Following this the urine cleared up and remained clear.

Female, age twenty-four. Scarlet fever two months previously. Taken suddenly with severe right sided abdominal pain and was given morphine. Eighteen hours later had another attack of severe pain. Temperature 101° F., pulse 132. Tender and quite rigid over the right lower quadrant. No urinary symptoms but considerable pus in the urine. Leucocytes 17,000. Pyelitis was suspected but in the presence and muscular rigidity, it was thought wise to remove the appendix. It was found to be acutely inflamed and bound down with many adhesions. The right kidney was large. The patient made a good recovery from the operation but the pus remained in the urine for some weeks, eventually clearing up.

Female, age thirty-four. Pain in the side and some frequency, with pus in the urine. Tenderness and rigidity over the appendix. An appendix showing signs of inflammation was removed; the pus persisted in the urine for some weeks.

Female, age thirty-four. Acute pain developed suddenly in the right side; temperature 101° F., pulse 120. Tenderness was noted over the right kidney, and some pus cells found in urine. Owing to the amount of tenderness over the appendix it was thought wise to remove it. It was found to be retrocœal and acutely inflamed. Pus in the urine persisted following the removal of the appendix.

Conclusions from the study of the cases.

1.—Pyelitis must be suspected in any unexplainable, febrile condition in children.

2.—Pyelitis must always be excluded in acute abdominal conditions, especially appendicitis.

3.—It must be kept in mind that appendicitis and pyelitis may both occur simultaneously.

4.—The early diagnosis of pyelitis may be difficult, because at first there may be no urinary symptoms or even pus in the urine. A careful history, palpation of the kidney region, and even a cystoscopic examination may be necessary to establish the diagnosis.

The Chronic Stage of Lethargic Encephalitis.—J. Mendl (*Wien. Arch. f. klin. Med.*, June 15, 1925, p. 559), describes the following characteristics of the chronic stage of lethargic encephalitis. The first is the corpse-like attitude of the patient, who lies motionless on his back in bed, very rarely on his side, with an apparent absence of interest in his surroundings, and the eyes wholly or partially closed. In advanced cases the patient lies the whole day with his arms across his chest and his legs extended, and the feet in a position of equino-varus. The second characteristic feature is that in spite of this absence of movement, which may last for months, it is only rarely that extensive bedsores develop, in contrast with other severe chronic diseases of the central nervous system. This absence of susceptibility to bedsores indicates immunity of the trophic nerves, or a diminished vulnerability of the skin, or an association of these two factors. The third characteristic is the patient's gait, in which the extensor type predominates. The head is drawn slightly back, and the vertebral column and scapulæ are kept rigid. The spastic character of the gait is more or less pronounced. In an advanced stage the patient walks on the balls of his toes, keeping the rest of the foot in a position of equino-varus. In milder cases the foot is brought to the ground with a stamp. The arms are kept in a position of adduction in walking, and slightly flexed at the elbow. Treatment of any kind, including protein therapy, injections of salvarsan, and inoculation of malaria, has proved ineffectual. —*Brit. Med. Jour.*, Sept. 20, 1925.

THE SURGICAL TREATMENT OF TRIGEMINAL NEURALGIA*

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IT is the purpose of this paper to present some observations regarding the operative procedure of section of the sensory root for Trigeminal Neuralgia (Tic Douloureux). First, however, the symptomatology, differential diagnosis, and rôle of deep alcohol injections will be briefly reviewed. This can partly be accomplished by giving somewhat in detail the history of a typical case.

The patient, age twenty-eight, had a history which extended back five years, but despite this length of time, she remembered clearly her first stab of pain. This was sudden, momentary and knife-like through her right upper jaw, and came on without apparent cause while she was out for a walk. She stopped, cried out, and grasped her cheek. The pain was over in an instant. A few days later there was a similar recurrence. For several weeks the attacks became so frequent that she was completely disabled, the periods of relief between the stabs of pain being only a matter of minutes. She learned that various stimuli, such as eating, talking and brushing her teeth, were very apt to bring on a spasm. Considerable difficulty was experienced in getting to sleep; however, once asleep, she was never awakened by pain. The first spasms of pain which involved only the right second division, covered a period of several weeks. This period was followed by relief for some months when the malady returned, persisted for some months, and again was followed by a period of relief. In this manner her attacks of pain kept coming and going from 1919 to 1923, during which time all her upper teeth were extracted, tonsils removed, various nasal operations were performed and drugs of all sorts prescribed.

During the early part of 1923 a deep alcohol injection of the second division was carried out and complete relief was obtained for nine months. The pain then recommenced, but this time there were some additional stabs through the first division up over the forehead. Again an alcohol injection of the second division was carried out and almost complete relief was obtained for fourteen months. A few weeks ago, the pain returned with increased violence, the patient was able to take only liquids, and was afraid to speak or laugh. While taking her history, one was able to observe two spasms of pain, which brought about contorsion of the right side of the face and caused her to cry out. She described these spasms of pain as being like an electric shock, commencing in her right upper lid and travelling upwards through her eye over the forehead.

This story is so typical, that, at the risk of being tedious, it has been given in full. In going over the histories of these cases, one is impressed by their similarity. The essential feature is the type of pain, which is excruciating, sudden, momentary, with varying periods of complete relief. It may radiate through any one or all of the three divisions of the trigeminal nerve, most rarely the first. It should be noted that this patient, despite her typical story, has had all her teeth extracted, the tonsils removed and several nasal operations performed. No case suffering from major trigeminal neuralgia is benefited in the least by any such procedures.

It is interesting to note that this patient was never wakened from her sleep—the usual story in these cases—and this is most likely accounted for by the complete rest of the parts and the absence of stimuli during sleep.

In such an outstanding case as quoted, there should be no question even from the beginning regarding the diagnosis, but in a less typical case, one must be on guard and consider the following painful disorders:

1.—Neuralgias accredited to the sphenopalatine ganglion, the so-called Sluder's neuralgia.

2.—The neuralgias accredited to the geniculate ganglion of the facial nerve.

3.—Post-zoster neuralgias (trigeminal and geniculate).

4.—Painful convulsive tic.

*Read before the Academy of Medicine, Toronto.

5.—The minor trigeminal neuralgias, due to trauma, teeth, sinus infection, etc.

6.—Neuralgias due to tumours.

7.—Glosso-pharyngeal neuralgia.

It is beyond the scope of this paper to discuss the differential diagnosis of these painful conditions in full.

The treatment of trigeminal neuralgia should be considered under two headings: (1) The rôle of deep alcohol injections; (2) section of the sensory root.

The rôle of deep alcohol injections.—A full discussion of this important form of treatment would necessitate a separate paper. Deep extracranial injection of the first division is not possible on anatomical grounds. Injection of the second and third divisions at their exits from the skull is fairly easily carried out, with a reasonable expectation of relief even up to three years. Each succeeding injection, however, will be more difficult because of the resultant scar tissue formation. To carry out the injection, one must have a working knowledge of the deep anatomy of the base of the skull. A fine needle marked off at the six centimeter point, for orientation as to depth, is introduced. One only knows that one has struck the nerve by producing the typical radiating pain—hence the necessity of not having your patient under an anæsthetic. Local anæsthesia of skin, however, is desirable. Good co-operation on the part of the patient is essential, although if the patient be suffering from a real tic, the pain produced by the needle striking the nerve is no new sensation. Having hit the nerve, two centimeters of 80 per cent. alcohol are introduced and, in a few moments, there will be complete anæsthesia over the area supplied by the division. One must be very optimistic indeed to believe that he can do more than inject alcohol in the region of the nerve, when the patient is under an anæsthetic; only occasionally may a good injection be obtained in this way. There are further objections to the use of a general anæsthetic and two complications, which are easily recognized, if the patient is not anæsthetized may be mentioned. (1) Injection into the Eustachian tube; (2) injection into the sixth or even the third nerve.

Again the importance of being thoroughly orientated before injecting the alcohol must be mentioned. The only true guide is to hit the nerve with the needle and produce the typical spasm of radiating pain.

Now just a word about the injection of the Gasserian ganglion through the foramen ovale. It is difficult to understand how anyone can have sufficient confidence in this technique to believe himself capable of always injecting the ganglion and not entering the sub-arachnoid space; this complication has occurred many times with results that are deplorable. One case on record had a complete paralysis of almost all the cranial nerves. Dr. Cushing[1] reports a case having such extreme vertigo six months after a ganglion injection that she could not hold up her head. Also judging from the literature, severe eye lesions are frequent, as after the old operation of removal of the ganglion.

In brief, this subject may be summed up by quoting a few conclusions from a paper by Cushing[2] in 1920:—"deep extracranial injections of alcohol into the maxillary and mandibular nerve trunks, near their foramina of exit from the skull, have completely superseded peripheral neurectomies. In neuralgias limited to one of the two lower divisions, alcohol injections represent unquestionably the treatment of choice. They are sometimes useful furthermore, in determining in doubtful cases whether the syndrome is a true neuralgia of the tic douloureux type or one of the peculiar and rare pseudoneuralgias not amenable to relief either by injections or operations. Also, they give the patient some warning as to what the numbness resulting from a sensory root division may amount to. With such perfect and permanent results as may be secured to-day by a trigeminal sensory root section the prolonged and repeated use of injection of alcohol in refractory cases or in those in which more than one division or the first be involved is to be deplored."

Operative Treatment.—Unfortunately it is far from common knowledge amongst the laity and our own profession that the mortality of the operation is very low—less than 1 per cent with experienced operators — despite the fact that many patients are over sixty-five years of age. Advances have been very rapid and we are no longer dealing with a mortality, which in the past, ranged from ten to twenty-five per cent. Disfiguring post-operative scars and severe eye complications are also no longer to be feared.

Historical Sketch.—A brief historical sketch of the operation is very interesting and fills one with admiration and respect for those who have developed our present-day technique. Who now

would have the courage to attack the Gasserian ganglion by removing the upper jaw and trephining the base of the skull? In 1890, Rose[3] the first operator to successfully remove the ganglion, followed this route. Shortly before this, Sir Victor Horsley,[4] who felt from his dissections that the ganglion could never be removed without tearing the wall of the cavernous sinus, attacked the sensory root and not the ganglion by making a large lateral bone flap, opening the dura and elevating the brain stem. He then cut the root, but the patient unfortunately died of shock.

It is really unfair to quote Rose as removing the superior maxilla to get at the ganglion. The truth of the matter was that the patient refused to have anything done unless her jaw was removed, as this appeared to her to be the real seat of the trouble. The willingness to submit to such an operation shows if nothing else, the possible severity of this malady which in the past has frequently led its sufferers to suicide.

In subsequent operations, Rose and other operators adopted the pterygoid route; one which gave a very limited exposure and involved a very difficult dissection. Shortly after Rose reported his first cases, two surgeons, Hartley and Krause independently practised the turning down of a temporal flap. The dura was elevated and the ganglion approached along the floor of the middle fossa. Various modifications of this Hartley-Krause route were then advocated and practised. The incision was modified so that the superior branch of the facial nerve was not injured, the zygomatic process along with varying portions of the skull resected so as to give a lower exposure. The principle of this method of approach, namely extra-dural along the floor of the middle fossa, has withstood the test of time and is now, though much simplified, universally adopted.

From Rose's first operation in 1890 until 1901, all operative procedures with the exception of Horsley's[4] one case, were planned to remove the ganglion. Because of its anatomical relations, this was a very difficult and bloody procedure and was followed, as is injection of the ganglion itself, by frequent severe eye complications.

It seems strange that, not until 1898, do we again find Spiller[5] of Philadelphia suggesting that the sensory root behind the ganglion be cut. He and Frazier carried out experimental work to show that there is no central regeneration of the nerve, although this point had been fairly definitely settled some years previously by Sherrington.[6] Furthermore, Sir Victor Horsley had conceived the operation, but unfortunately chose a route which necessitated so much trauma, that the patient did not survive.

Frazier[7] in 1901, successfully operated on a patient by section of the sensory root just behind the ganglion. The patient obtained complete relief, which persisted. Since then, this Frazier-Spiller operation has been universally adopted. Recently Frazier[7] has modified his technique in dealing with cases that have not the first division involved. In certain of these cases he has purposely sectioned only the outer two-thirds of the root leaving the fibres to the first division. This has a very definite advantage as it leaves the sensory supply of the eye undisturbed. If later the first division becomes involved it would be a simple matter to complete the section. This refinement of technique appeals to one as being well worth while and should be adopted in properly selected cases. Recently we have had the opportunity of successfully carrying out this procedure on a blacksmith. His first division was not involved and one was anxious to leave the sensation in his eyeball intact.

The position of the patient is important. My personal experience is based on twenty-three operations during the past two and a half years. There has been no mortality. Eight of these were performed with the patient recumbent. After visiting Adson's Clinic this method was abandoned and the operation is now carried out with the patient sitting up. During the past year this technique has been carried out on fifteen cases, and the operation is found to be much simplified by this position. With the patient recumbent there is constant flooding of the field with blood rendering the dissection often extremely difficult so that one was always thankful when the procedure was over.

Technique.—The following photographs and drawings illustrate the technique now in use. The necessary area of the head is shaved just before operation, and no attempt is made to sterilize the skin until just before the drapes are applied, when a thorough cleansing with alternate bichloride and alcohol sponges is carried out.

XUM

General anæsthesia is preferred by the writer although the first stages of the operation including the removal of the bone, can be easily carried out by local infiltration with 1 per cent. novocaine. Since shock, either at operation or post-operatively, has not been a complication so far even in our oldest patients, several of whom have been past seventy, we doubt the wisdom of subjecting our patients to this extra mental strain for the sake of saving one half-hour of general anæsthesia, especially when experienced administrators are available. Ether anæsthesia by the intra-tracheal or intra-pharyngeal technique is employed; the patient preferably being anæsthetized in the semi-sitting posture and is then gradually raised to the sitting position, to avoid the fall in blood pressure that sometimes occurs when a sudden change from a dorsal to a sitting position is effected. Nitrous oxide oxygen sequence is to be preferred to the ethyl-chloride ether sequence when this position is used. Nitrous oxide oxygen might be employed throughout, but we have felt that since shock does not seem to complicate the picture. that it would be unwise to risk any possible interference with the operative field by the mask or head straps occasioned by its use.

FIG. 1.

In Fig. 1 the drapes have been removed and show the patient in the sitting position. The head is held in position by a modified dental head rest adapted to the tipped-up end of an operating table. The table as a whole can be lowered or raised so that the operator may work with the field at a comfortable level. The position of the vertical split-temporal muscle incision is shown. Retraction is maintained by an ordinary mastoid retractor. The incision has been carried down to the zygomatic arch. A short, low anterior cross incision in the muscle may be necessary to get better exposure in the lower part of the field. A burr hole is made through the bone and enlarged so that the subsequent steps are carried out through a somewhat square opening, 1½ x 1½ inches, with its lower border at the level of the zygomatic arch. A branch of the middle meningeal artery is often injured while removing the bone. If the bleeding is troublesome and not conveniently controlled by pressure made with a flat retractor, it is best to open the dura carefully and then pass a ligature around the vessel or clip it. If one passes a ligature without opening the dura, extreme care must be used to avoid injury to an underlying cortical vessel. For the most part this is not necessary, the bone can be rapidly rongeured away and then the upward pressure of the flat retractor, used in the subsequent steps will control bleeding from above. Bleeding from the bone edge is controlled with bone wax.

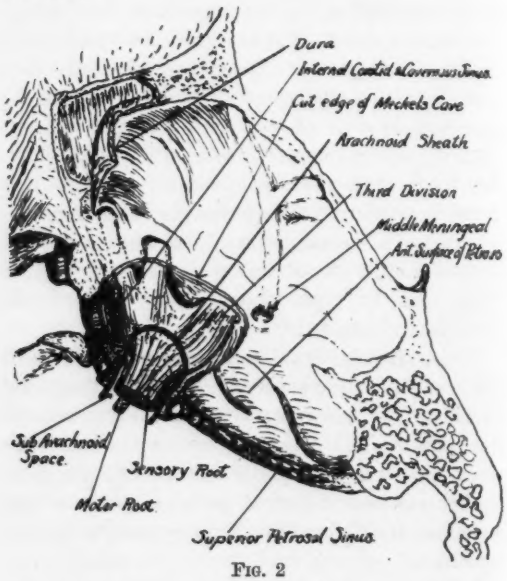

FIG. 2

Before proceeding with the subsequent steps let us refer to Fig. 2. Here we are looking down on the floor of the right middle fossa

The dura is intact, with the exception of the roof of Meckel's cave, which has been cut away. The manner in which the dura passes deeply to the ganglion to form the floor of the cave is thus made apparent. The sheath of the arachnoid and its attachment to the ganglion is shown. The sensory and motor roots and the upper part of the ganglion are surrounded by cerebro-spinal fluid of the subarachnoid space. The superior petrosal sinus passes from the cavernous sinus across the superior surface of the sensory root. The close relationship of the mesial portion of the ganglion to the cavernous sinus and its contents are apparent. With these anatomical points in mind, let us proceed with the operation in a right-sided case. The dura is dissected from the floor of the middle fossa and elevated with an electric-lighted retractor. The only point of orientation at this stage is to keep to the lowest portion of the floor and go straight in. The middle meningeal artery at the foramen spinosum will soon appear. Certain difficulties may arise in this dissection. The dura may be very thin and accidentally opened, necessitating careful covering of the brain to prevent injury to the cortex while manipulating the retractor. The floor may be exceptionally irregular, making the separation of the dura difficult and thus the middle meningeal artery may be torn through before it can be brought clearly into view. When this occurs the field is flooded with blood until the foramen spinosum is blocked with wax. This has to be done more or less blindly in the depth of the field, and one may have to repeat the manœuvre many times before the dissection is carried past the foramen spinosum, which can now be seen and more accurately blocked with wax. Apart from the middle meningeal bleeding there may be troublesome oozing all along, which can be best controlled with well placed small pads of cotton and the use of a sucker.

In most cases, it is possible to clearly define the middle meningeal artery and control it with a silver clip or ligature. The artery is then divided. A little deeper dissection, somewhat forward, will quickly bring the third division at the foramen ovale into view. One is then thoroughly orientated.

Fig. 3 has been made at this stage. The foramen spinosum and foramen ovale do not always bear the same relationship to one another. I well remember a case in which they were apparently both together or the small meningeal

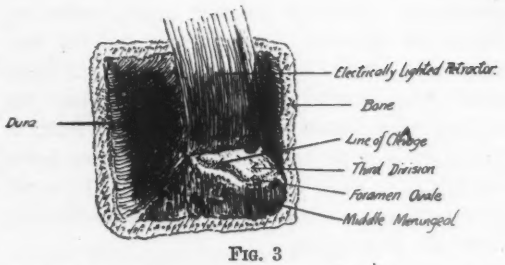

FIG. 3

which normally accompanies the third division had taken on the function of the middle meningeal. The patient had had many alcohol injections and the third division was small and embedded in fibrous tissue. The third division along with the middle meningeal was cut through without appreciating the fact. Dissection was then carried on to find the nerve which had already been cut. A glance at the anatomical sketch will show that if one gets through the third division, further dissection carries one deep to the ganglion and up to the cavernous sinus, and a very bloody path it is, as the ganglion derives its blood supply from its under side. Fortunately I was finally able to orientate myself and complete the operation, not by sectioning the sensory root, but by division of the second division at the foramen rotundum. This has given complete relief for two years as the patient did not have involvement of the first division. Section of the sensory root will eventually have to be performed on this patient, when the second and third divison grow down again.

The third division is now followed upward and backward. This necessitates the separation of the roof of Meckel's cave from the third division and the ganglion, and a correct line of cleavage must be defined along the posterior border of the ganglion and between the third and second divisions.

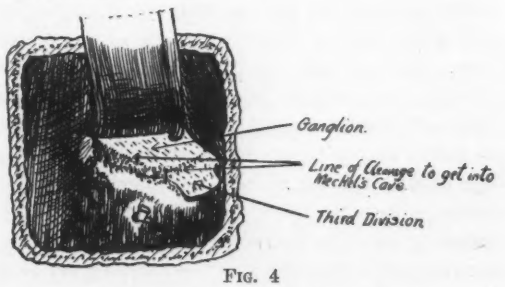

FIG. 4

Fig. 4 shows the point at which the line of cleavage has been made, and also the whole of the third division and part of the ganglion

uncovered. Soon the bulging, bluish, pulsating arachnoid appears. Beneath this lies the sensory iroot (See Fig. 2 and Fig. 5). A portion of the arachnoid is then opened, and the sensory root, floating in cerebro-spinal fluid, is then clearly apparent. The assistant then holds the retractor while the operator manipulates the necessary instruments to separate the sensory from the motor root.

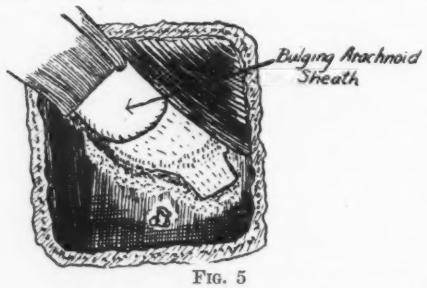

FIG. 5

The sensory root is sectioned and turned down. The motor root will then be seen to be passing through a separate opening in the posterior wall of Meckel's cave (See Fig. 6). Electrical stimulation is not necessary for identification of the motor root.

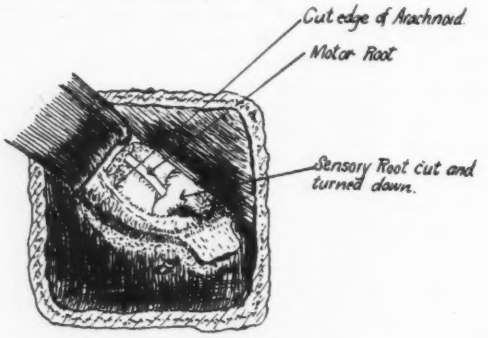

FIG. 6

This practically completes the operation. All oozing must be carefully controlled. For the most part this will have ceased, but if not, a few well placed bits of temporal muscle on the bleeding points will dry up the field. Closure of the temporal muscle and fascia is carried out with continuous catgut, without drainage. It is much better to spend extra time getting a dry field and doing without drainage. Drainage leaves a possible track for infection, a complication so fatal in neurological surgery. A protective watch-glass shield is held in position over the eye by adhesive and should be worn for several days. Nurses are warned to wipe away any secretion from the eye without touching the cornea, which is of course insensitive. Later, when the wearing of this shield is discontinued, the patient is warned against touching the cornea and advised to wash the face in front of a mirror Goggles should be worn when motoring. If the eye should become inflamed, the wearing of the air-tight glass shield for forty-eight hours will generally clear it up. Especially must the patient be warned against allowing anyone to place the ordinary eye pad over the eye, for if this is done they will almost surely open the lid and abrade the insensitive cornea. All of these directions should be carefully explained to the patient and also supplied in writing. With reasonable care, eye complications do not occur.

Before operation, it is well to explain clearly to the patient the disadvantages of the operation. They are as follows:—

1.—Total and permanent loss of sensation over the whole side of the face, unless the case be a suitable one to leave part or all of the first division fibres.

2.—The necessity of a moderate amount of care to protect the eye from particles of dust. This of course will not apply if the first division fibres are left.

3.—A temporary facial weakness occurs in one in thirty cases. The exact cause of this weakness is unknown. It occurs in every clinic. We have had one case. This weakness was complete immediately after the operation and still persists, after three months, with very little improvement.

Summary

1.—Section of the sensory root of the fifth nerve is described and illustrated in detail.

2.—The diagnosis, symptomatology and rôle of deep alcohol injections is briefly reviewed.

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Note.—I am indebted to Dr. B. Guyatt, of the Anatomy Department of the University of Toronto for the drawings.

ULCERATIVE COLITIS

Report of a Case Requiring a Permanent Colostomy

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DURING the past ten years the attention of the medical world has been frequently directed towards the problems involved in ulcerative colitis. The result has been an enormous amount of literature upon the subject. My excuse for again directing your attention to the topic is briefly to report a case which presents a number of features of unusual interest.

The patient was an office man aged forty-two years, 5 feet 11½ inches in height, and weighing 136 pounds; spare and slender but wiry, he had always been in good health up till May 20, 1922. At this time he attempted to correct a condition of constipation by taking a well known cascara preparation, and almost immediately thereafter developed hæmorrhoids. This troublesome condition soon became aggravated by intermittent attacks of diarrhœa and constipation, and bleeding set in; in a few days pus also was found to be mixed with the discharge. In the early days of June, 1922, his condition was further complicated by acute arthritis in the elbows, wrists, knees, and ankles. It was to relieve this painful rheumatic condition that I was first called, on June 13, 1922.

His temperature was then found to be approximately 102° F. The hæmorrhoids were very prominent, the diarrhœa was now continuous, profuse and uncontrollable, and was aggravated shortly after the taking of food. Treatment was immediately commenced by regulation of the diet, by the use of liquid petrolatum, intestinal antiseptics and astringents by the mouth, and various irrigations for the colon. Little effect could be seen as a result, however, except that the arthritic pains subsided slowly. His condition, though at first appearing to improve, became gradually worse; his storage of body fat and other available tissue became expended and the very profuse discharge depleted and weakened his whole system.

The Widal and Wassermann tests were both negative. Examination of the stools failed to disclose signs of either the amœba of dysentery or the tubercle bacillus. His temperature ran a continuous course of a septic type, varying between normal and 103°. The pulse, as the case proceeded, became accelerated to 110 and 120 and frequently higher. In this condition he was finally induced to go into the hospital on August 13, 1922. On August 14th, an examination of the blood showed a leucocyte count of 14,400. On August 15, I made a proctoscopic examination and found deep, ragged-edged bleeding ulcerations, commencing about one inch within the rectum and involving about one-third of the circumference of the bowel. The whole lining of the visible bowel was acutely inflamed. His condition made it inadvisable to attempt more extensive examination by the sigmoidoscope, but a specimen of tissue from the margin of the ulcer was removed. This was reported by the pathologist to be a condition of ulcerative colitis. His condition up till now did not warrant the effort on his part for securing an x-ray of the colon.

On August 20th, his condition rapidly became more alarming, the pulse rose from 120 to 160, and he became dull and listless. I immediately did a rapid cæcostomy under nitrous oxide anæsthesia. Through this wound saline irrigations were given at first every two hours. No difficulty whatever was experienced in having the normal saline traverse the whole colon tract, and discharge by the rectum, as the sphincter ani had for several weeks been completely relaxed. To prevent the continued passage of fæcal matter by that route with consequent irritation to the ulcers, the normal saline was introduced through a rubber catheter inserted into the cæcostomy opening and passed upward almost to the hepatic flexure. This arrangement practically washed all fæcal matter downward and out by the cæcostomy opening

instead of along the normal colon route. Under this treatment the patient's pulse became steadier, about 120, and his temperature subsided to normal. His appetite returned and the outlook appeared altogether brighter.

On August 30th (ten days after the operation) as a result apparently of some digestive disturbance, he took another turn for the worse; the pulse in a brief while rose to 168 and the temperature to 103½° with signs of a general collapse. From this he rallied under stimulants and warmth, and twenty-four hours later found his temperature normal and the pulse back to 120. On September 3rd, another exacerbation occurred for which no very clear reason was apparent. His temperature again rose to 103.6° and his pulse to 168; as on the former occasion in twenty-four hours his temperature was back to normal, and his pulse to about 120

These exacerbations with alarming symptoms were repeated in all five times, causing the greatest anxiety. His inclination for food in his extremely weakened condition seemed to be the chief cause of the attacks, as at times he partook more freely than his conditions of digestion and assimilation warranted. The result was an acute attack of indigestion sometimes causing vomiting but more often producing green stools, liquid in character and increasing in frequency and offensiveness—culminating in a rise of temperature and pulse with other alarming symptoms of exhaustion. Stimulants were used freely with the most readily assimilable foods, and the green citrate of iron was given intramuscularly for many weeks to correct a progressive anæmia which had been advancing from the onset. The citrate of iron seemed to be of decided value, as his colour, his general condition, and especially his ability to assimiliate food improved greatly. Indeed I am convinced that without it in this case recovery would have been impossible. The frequency with which anæmia accompanies this disease is noted by some who assign it a place as an important ætiological factor. It undoubtedly is an important condition to deal with under the circumstances, and the intramuscular injection of suitable iron preparations has proved safe, efficient, and a happy substitute for administration by the gastro-intestinal channel when the latter cannot be relied upon.

Many solutions were tried for irrigation purposes but normal saline seemed to give the best results. During the subacute stage irrigations were given every four hours and every eight hours during the subsequent months. After a rest period of twenty minutes following an irrigation to permit of the excess of fluid draining off, an instillation of 10 per cent. argyrol was made. This application proved much the best of several tried. It seemed to soothe the inflammatory condition as shown by a prompt reduction in the amount of blood and pus.

From the time of leaving the hospital September 24, 1922, until January 18, 1923, he was attended at home by a trained nurse, receiving treatment as outlined. During this period his condition gradually improved, his weight made slow but constant increase and his colour became better than when he was in his usual health. In late January, 1923, he commenced going about, still, however, receiving the dressings every eight hours with the follow-up instillations of argyrol. His weight by April, 1923, had reached normal but the discharge of pus and blood from the rectum had not yet fully disappeared. The slightest attack of indisposition, whether from cold, or slight indigestion, or fatigue from lateness of retiring, always produced a reaction resulting in an increase of pus and blood. As yet nearly all the fæcal matter was being discharged into a dressing through the cæcostomy opening.

On April 11, 1923, he was again admitted to hospital for examination of the rectum, and for an x-ray of the colon to determine the condition left by long protracted ulceration. Under anæsthesia it was found impossible to make a sigmoidoscopic examination on account of narrowing of the lumen of the bowel resulting from scar contraction. A stricture located at the lowest point of ulceration immediately above the sphincter, and extending upward for about an inch and a half, would not permit of the index finger without tearing. To insert the sigmoidoscope was therefore impracticable. A gastro-intestinal barium series was made at this time with a pressure dressing applied to the colostomy, intended to keep the opening closed and so to force the entire bowel contents through the normal route of the colon. Of this examination the following is the full report:—

"The gastro-intestinal tract examined following an opaque meal shows the stomach to be regular in outline

and normal in position. The duodenal cap is normal. At the five hour examination there is a 10 per cent. gastric residue. At the twenty-four hour examination the meal is throughout the large bowel and shows evidence of spasticity with narrowing of the rectum. Summary:—There is no evidence of ulcer of stomach or duodenum nor of new growth of the stomach. The slight delay in the emptying time of stomach may be produced by the reflex irritability of colon. Colon:—The colon examined following injection of an opaque mixture shows a much narrowed irregular ampulla. The pelvic loop does not rise up as it should. Proximal to this the colon is spastic. There is no evidence of incompetency of the ileo-cæcal valve. There is evidence of an ulcerative colitis involving practically the whole of the large bowel and resulting in a narrowing and irregularity of the rectum.''

At this time his temperature averaged from normal to 99.5°, his pulse from 100 to 120. During May and June he was about, wearing a dressing of gauze over the cæcostomy outlet which was changed frequently as occasion necessitated. In July he spent some weeks at his summer resort returning in August, 1923, looking exceptionally well and weighing about eight pounds above his ordinary weight.

FIG. 1.—Prolapse of the bowel which developed after wearing colostomy bag.

Commencing August, 1923, a cæcostomy bag was used over the opening for the first time. It proved highly satisfactory but soon it was noted that the bowel protruded slightly through the wound where the absence of support permitted prolapse. At first a mere nodule was extruding. In five months the prolapsed mass had increased till it was about the size of the fist and about three and a half inches long When this prolapse first commenced it receded every night on retiring; later the prolapsed portion receded only partly during the night and as the mass became still larger and the firm edge of the cæcostomy wound formed a hernia ring of considerable rigidity there was practically no longer any reduction of the mass upon lying down. The patient suffered no pain nor even discomfort from the prolapsed portion of bowel. At no time was it sensitive though he was able to feel when its surface was touched . At times friction against the wall of the cæcostomy bag caused slight but painless excoriation and bleeding of the bowel surface. The mass was naturally much congested as a result of constriction at the point of exit. The extruded bowel presented an interesting picture, being the reversed caput coli with the incoming opening of the appendix, the ileo-cæcal valve and the lumen of the ascending colon in full view.

While this condition of prolapse was present all fæcal matter was discharged into the rubber container direct from the ileo-cæcal valve and consequently none whatever entered the colon to pass by the natural route. The patient wore this bag continuously from early August, 1923, to April, 1924, during nearly all of which time he carried on his office work with no discomfort apart from the inconvenience attendant upon his condition. But this state of affairs was far from satisfactory as a permanent state, since the mass was becoming gradually larger and had in some way to be corrected, if possible.

In April, 1924, I replaced the bowel, reducing it as when reducing an incarcerated hernia. This procedure took about twenty minutes and demanded fairly severe pressure but caused practically no pain to the patient. The condition remained reduced for the night. The next day on rising, the bowel rapidly prolapsed again almost as previously but was (the following evening) more readily reduced. As was to be expected after reduction, there was a tendency for fæcal matter to pass through the colon as normally. Discharge from the rectum during the period of cæcal prolapse was constant but scant, and consisted of mucous pus and a small

but varying amount of blood. This was much increased and aggravated after reduction of the prolapse by the additional passage of fæcal matter. In May, 1924, as it was found impossible to keep the bowel in, I designed an obturator pattern in wood which fitted closely the opening of the cæcostomy bag. The surface of this obturator which was to be applied over the cæcostomy outlet presented a number of openings sufficiently large for the through passage of the fæcal matter but not large enough to permit of prolapse of the cæcum. This obturator form was then duplicated by a dental mechanic in hard, highly polished dental plate rubber. Experience with this showed that the

FIG. 2.—Showing the colostomy bag and the vulcanite obturator as it appears before insertion.

obturator effectually prevented the bowel from extruding but it slightly retarded the passage of fæcal matter and caused a greater tendency for this to pass by the normal colon route. This in turn began seriously to aggravate the smouldering ulcerative condition increasing the pus and blood and causing a general malaise and a recurrence of the arthritis with rise of temperature necessitating the patient's return to bed. His condition made it imperative that the obturator be removed and the upright position resumed to induce the cæcum to prolapse again in order to secure recovery from the general toxic symptoms.

FIG. 3.—Showing the colostomy bag and the vulcanite obturator in position.

FIG. 4.—Showing the condition of the colon after twenty-six months of ulcerative colitis.

To ascertain the condition of the bowel another x-ray was taken and the condition on July 18, 1924, was reported on as follows:—Examination with an opaque mixture injected through the cæcostomy opening showed the colon to be very irritable, the haustral markings absent and definite small filling defects which indicate ulcerative colitis."

The situation on July 18, 1924, might be summarized as follows:—

(1) There was an ulcerative colitis of twenty-six months' standing during all of which time healing had never been complete; there had been a continuous discharge of pus and mucus with a trace of blood.

(2) There had been a colostomy from August 20, 1922, twenty-three months, during which time all the fæcal matter had discharged through the colostomy opening while irrigations and argyrol instillations had been given through the colon for many months to induce healing if possible.

(3) According to the x-ray almost all the colon except the cæcum and a few inches above it had been damaged by the ulcerative process.

(4) A prolapse of the cæcum had developed which, with the exception of a few days, had been continuously out for eleven months. The colon during this period was spared the irritating effect of the fæcal matter upon its ulcerated surface. When the prolapse was reduced as it had been for a few days in May the patient immediately suffered from an exacerbation of the ulcerative process with general malaise, acute arthritis, rise of temperature, and other symptoms.

(5) There was damage to the sphincter from ulceration, rendering control impossible; even if all else had been satisfactory this would be a tremendous handicap in the event of closure of the colostomy.

(6) The patient had had the experience of wearing the colostomy bag for almost a year, and was quite conversant with the conditions should he have to accept this handicap for life.

It was evident from the experience of the past and the condition as outlined, that some operative procedure would have to be undertaken to make impossible the passage of fæcal matter by the normal route of the colon. If this were done the continuous use of the obturator in the colostomy bag would have little likelihood of causing any handicap and would prevent the recurrence of a possible prolapse. According, on July 25, 1924, I resected a short portion of the colon at the hepatic flexure in order to interrupt its continuity. The severed end of the proximal portion was disposed of by passing a corded silk suture with needle on each end through the bowel wall into the lumen high up and both of these needles were grasped in turn by forceps passed through the colostomy opening into the bowel and thence upward. Thus the two ends of corded silk were drawn down inverting that portion of the ascending colon within itself until the severed end came down to the colostomy opening. During the process of this infolding several layers of stitching securely closed the peritoneum behind. Precaution was especially taken to interfere as little as possible with the circulation of the colon at its mesenteric supply. The severed end of the distal portion was passed forward through an incision in the mid-abdominal wall about two inches above the umbilicus and sutured in this position with its open end free for the introduction of irrigation fluids and other treatment. The operation area was drained through the flank just above the reflexion of the inverted ascending colon and the operation wound through the anterior abdominal wall was then completely closed. The patient's lowered resistance was emphatically expressed by a suppurative condition in the wound of the operative incision but this in due course completely healed. Precaution was taken in regard to dressing the original colostomy wound, especially until the inverted ascending colon would be firmly healed in position. The position of the inverted bowel was made more secure by the corded silk which held the severed end of the bowel within the cæcum and passed through the colostomy to be firmly fastened with adhesive to the skin of the thigh below. No trouble was experienced with this at any time.

The wound in the abdominal wall through which the severed end of the distal portion of the colon was implanted healed perfectly and for several months twice a day it received instillations of argyrol. The ulcerative process in this portion of the bowel has absolutely refused to heal, and an intermittent discharge of mucus and pus persists with a not infrequent trace of blood, the daily amount for several months

aggregating from one-half to one ounce. At times for half a day no discharge passes this way but suddenly without warning and without control it is evacuated. This handicap apparently will have to be considered permanent. The free discharge was later much reduced by inserting at bedtime into the proximal opening of the distal portion of the bowel a four inch bougie containing twenty grains of bismuth subnitrate in fifty grains of cocoa butter. When the patient is subjected to any nervous excitement or fatigue in work, or his condition of health becomes temporarily reduced, at once he notices an increase of this rectal discharge.

FIG. 5.—Showing the permanent condition of the colostomy. Above the umbilicus note the proximal end of the distal portion of the colon implanted in the abdominal wall.

Care of the colostomy.—The colostomy bag is worn during the daytime only. It is found essential to give the skin around the colostomy opening an opportunity for rest from the irritative effects of the rubber and the devitalizing effects of the pressure and discharge. A dressing of zinc ointment is found beneficial and sufficient when applied every evening after washing off the area. For the night a gauze and cotton absorbent dressing covered by a layer of cotton wadding over which a sheet of oil silk is placed as a protection from the abdominal binder, and gives comfort and security.

Indiscretions in diet have to be carefully avoided. Many articles of a laxative nature, for example figs, if taken during the day or evening will cause an uncontrollable discharge during the night, necessitating an additional dressing. During the day, practically every meal comes through before the next one is taken. The colostomy bag requires removal for emptying, generally before noon and always before the evening meal. Very seldom is any annoyance caused by the escape of the contents, so long as care is taken in putting on the container. Subsequent to the operation the patient wore the colostomy bag without the obturator but the bowel began to extrude slightly and in about a month he had to resort again to the use of the obturator. Since this everything has gone well.

FIG. 6.—The colostomy bag with obturator to prevent prolapse of the bowel is here shown in position. In the mid-line just above the strap may be noted the proximal end of the distal portion of the colon.

At present the patient is working full time every day. His appetite was never better. Since the last operation (July 25, 1924), he has gained eight pounds, and finds practically no inconvenience. He has become accustomed to

the routine of care necessary under such circumstances, and is gratified with his present condition. In dealing with this case the reader may have thought that an ileostomy would have been more suited to meet the requirements. Such a procedure was carefully considered from time to time. In view of all the features of the case and especially in view of the permanent handicap in prospect, it would appear that the choice made has given much more satisfactory results than an ileostomy would have done.

The resulting advantages from the operation are:—

(1) That all the fæcal matter passes by the colostomy opening, and is under perfect control.

(2) A fair sized cavity consisting of the cæcum and several inches of the lower portion of the ascending colon acts as a reservoir for fæcal matter. From the standpoint of absorption of fluids this must be of considerable value since it is to this part of the bowel that a large absorption function belongs. There has been no tendency to fæcal impaction and considerable voluntary control can be exercised through the muscles of the abdominal wall on the emptying of this cæcal cavity.

The ulcerative process meantime is not cured but is held in check.

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BACKACHE

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BACKACHE, although strictly speaking, not a scientific term, conveys the idea of a condition due to one or more etiological factors, sometimes to a combination of several. The term is usually applied by the patient to a painful sensation situated in the lumbar or sacral segments of the back. On account of the varied, and often inter-related causes it is always expedient to take a broad view-point, and to determine by painstaking and exhaustive examination the complete etiology in order that full and adequate treatment may be applied. A woman with a heavy retroverted uterus and a faulty posture will in most cases be a victim of backache. Treatment of one condition alone will rarely be adequate to produce the sought-for relief; orthopædic as well as gynæcological treatment is necessary. When one considers the frequency of this complaint not only in the ordinary run of cases but in the industrial world, where compensation boards meet with it daily, no apology is considered necessary for the presentation of this subject.

When a patient applies for relief from backache it is well for the surgeon to attempt to visualize mentally, if possible, in what tissue lies the pain-producing lesion. Is it in the bone, the joint with its component parts of ligament and synovial membrane, the muscle, or its tendinous attachments, or is it in the nerve trunk? One should also endeavour to determine whether the condition is inflammatory or mechanical or malignant. One of the most pitiably painful backs the writer has recently seen was due to metastatic carcinoma of the first lumbar vertebra and the sacrum. This was accompanied by a retroversion of the uterus, the correction of which, needless to say, gave little or no relief.

Bones.—The changes occurring in the bones may be due to metastatic carcinoma, tuberculosis, osteophytic lipping or trauma. Congenital bony abnormalities occasionally may be considered responsible as predisposing causes. If other causative factors are present such as infected foci, trauma or static and postural faults, sacralization of the congenitally enlarged transverse processes of the fifth lumbar vertebra may present a most painful condition.

XUM

Joints.—The lumbo-sacral joint is frequently found to be the site of an extremely painful condition due to strain or acute arthritis. Chronic arthritis is frequently found in this and other vertebral joints primarily or as a part of a more general osteoarthritis. Ligamentous strain in these joints has also to be considered.

Muscles.—Spinal muscles may be the seat of pain due either to strain from the gradual trauma of faulty posture or as a result of direct trauma as from a fall or a blow. A toxic or infective myositis may also have to be reckoned with. Muscle pain is often due to the persistent muscle spasm, protective in nature, guarding the mobility of an adjacent painful joint.

Nerves.—Pain originating in nerves is frequently due to impingement upon them of bony tissue, the result of trauma or osteoarthritic lipping or again it may be due to the pressure of inflammatory exudate in adjacent periarticular tissue. The exact mechanism of reflex, referred or projected pain has not as yet been satisfactorily elucidated. It appears to be an error in localization on the part of the cortex.

In determining bony changes either in structure or relations the x-ray is the most valuable diagnostic measure. The stereoradiograph has given us more information than the single antero-posterior and lateral views in the routine cases. As regards pain in the vertebral joints being due to mechanical or inflammatory causes the dictum of Sir Robert Jones[1] will be considered authoritative by all. He says:

> "A painful joint rigid in *all* directions is the seat of an arthritis, while a painful joint which is rigid in certain directions only—other movements being normal—is free from arthritis. Further if there be no limitation of movement in a suspected joint, there is no arthritis."

A consideration of these observations will assist one in examining a spine. An accurate diagnosis between a lesion in muscle and that in ligament is often not possible. When a muscle is sprained it usually means that certain fibres are ruptured, and if the pain is long continued it is commonly the result of many additional, but slight, strains before the scar has had time to heal. This means the constant accumulation of fibrous tissue. Pain in ligaments is referred to as a deep seated pain and it can be elicited both by movements of the spine and pressure with the finger. It is more apt to increase after a delay, and unlike muscle injuries, active and passive movements in the same direction give pain. Injuries of the back, if symptoms are long continued, are apt to be complicated with mild septic attacks and in that case the pain becomes more diffuse. If the muscle alone is affected the symptoms are intensified when the muscle or group of muscles is put into action; it is also increased when the injured muscle is placed under strain by stretching (Jones and Lovett[2]). The tendinous or ligamentous attachments of muscles in the region of the ilio-lumbar ligament and sacro-iliac joints are often the site of pain and of localized tenderness.

Classification.—The classes into which the greater number of backaches may be divided are: (1) Arthritic; (2) traumatic; (3) static; (4) pelvic and other abdominal reflex conditions. A given case, however, may present signs common to more than one type.

Arthritic Type.—In a series of 137 cases reviewed in the Bigelow Clinic, in which backache was a leading complaint, the most frequent type met with was arthritic, either primarily spinal or as a part of a generalized osteoarthritis. Osteoarthritic deposits, however, frequently were revealed by radiographs taken for other purposes, without having given rise to any accompanying symptoms. The pain of the arthritic process was usually accompanied by the pain of muscle spasm. Either one or both of the articular facets of the lumbo-sacral joint may be a frequent site.

Foci of infection considered responsible for arthritis in this and other spinal joints were the tonsils, abscessed roots of teeth, infected antra and pyelonephritis. There were three cases considered attributable to prostatic infection. Antrum infection seems to have become more prevalent as a focus in these cases since the advent of the influenza scourge of 1918 and subsequent years. Intestinal stasis in many cases, as revealed by clinical study confirmed by the barium enema, was a concomitant condition and no doubt was a frequent causative factor, as pointed out by Carter.[3] In this last type of infection it was found possible in a few of the cases to obtain cultures of colon bacilli from catheterized specimens of urine. In the arthritic class of backaches a history of trauma was occasionally obtained, which no doubt invited the infective process.

Traumatic Type.—Backache due to trauma

and not associated with arthritis usually consists of such injuries as fracture of the vertebral body or of the transverse process, or the sprain of spinal muscles or ligaments. Bauman[4] reports fracture of the transverse process of the fifth lumbar being a common injury in this type of case. Traumatic spondylolisthesis, although considered by some a common injury, occurred only twice in our series of cases. Darling[5] points out that there may be a congenital factor as well as the trauma in this type of painful deformity. A common but simple form of traumatic backache is found in some post-operative cases where dorsal recumbency is enforced in the case of a previously active individual. This is usually relieved by supporting the normal lumbar curve with a suitably shaped lumbar pad. In traumatic cases the radiograph will usually reveal the bone lesion. An examination of the back as regards pain in the various movements, together with deep palpation, will aid one in recognizing injury in affected muscles and ligaments. It is in such cases as these where continued compensation or a damage suit may be sought that one must exercise the keenest discernment. The shock received at the time of injury may leave an indelible mental impression which outlasts the real discomfort. The continuation of the disability, however, may be due to post-traumatic adhesions in periarticular structures. Sacro-iliac sprain is usually the result of lifting a heavy weight. The pain is often described as being sharp and localized in the damaged joint. Soon muscle spasm establishes itself and the pain then is described as being more diffuse, but on palpation localized tenderness can be elicited. Lumbo-sacral sprain is usually sustained when there is an element of twisting in the lower back at the time of the trauma. Spasm of *erector spinæ* muscle and localized tenderness accompany this injury. Usually side-bending is painful. The straight leg-raising test in the dorso-recumbent position will assist in differentiating the sacro-iliac from the lumbo-sacral lesion. Smith-Peterson[6] states that in doing this test one hand should be under the patient's lower spine. As the hamstrings tighten, leverage is gradually applied to that side of the pelvis. If pain is brought on before the lumbar spine begins to move, this reaction is in favour of either a sacro-iliac or lumbo-sacral condition, because the sacro-iliac joint is under leverage and the lumbar spine is moving. As we proceed with the test and do straight leg raising on the side opposite to the one complained of, in sacro-iliac cases we are able to bring the leg to a higher level without pain. In lumbo-sacral conditions, pain comes on at the same level as it does on the affected side.

Pelvic and Reflex. — Uterine retroversion pelvic varicocele, pelvic tumour, pelvic congestion at the menses, and pelvic inflammation, were frequently met with as causative factors in the production of low back pain. The pain usually was described as being in the sacral region and of a dragging nature, but was sometimes projected down into the thighs. In some, however, backache was not the only symptom but was associated with toxæmia, infection and even faulty posture. Bi-manual pelvic examination will clear up the diagnosis in the uncomplicated cases. Where co-existing pathology is suspected a thorough and searching general examination is called for. Occasionally, one finds such kidney conditions as pyelo-nephritis, perinephritic abscess, floating kidney or ureteral kink or calculi. Other toxic diseases, examples of which are variola and influenza in incipient stages, must not be forgotten.

The *static* or *postural* type of backache may be due to a definite orthopædic fault or a combination of them. Any variation from the normal upright posture, especially under the strain of work or a continuance in that posture for long periods of time produces muscle and ligamentous strain complained of as painful back.

Normally a person should carry his weight on his bones and not on his muscles and ligaments. In the upright position the body should be poised so that its centre of gravity lies well over its base, that the body weight may be borne chiefly on the rigid, bony framework. Variations from this proper, upright posture are found in round shoulders, lordosis, and flat back. Poor postures are exemplified in ill-nourished people, who stand with one knee bent and pelvis tilted producing a postural scoliosis, and often with stooping shoulders and a round back. These have less lung room than normal, a jack-knifed spinal column pressing on the solar plexus, a cramped liver space, all still further impairing their health and producing a vicious circle. It is astonishing what the cultivation of a correct posture will do for such, not only in

relieving backache but in improving general nutrition.

Others with pendulous abdomens and consequently hollow backs and marked increase in the normal inclination of the pelvis complain of backache and tenderness over the sacral and sacro-iliac regions. These with forward position of the centre of gravity attempt to right this faulty position by leaning back and thus put constant strain on the back muscles and ligaments. In all backache of postural type, one should be cognizant of any defect such as pronated foot, knock-knee, so common in stout women, contracted tendo Achillis as a result of wearing too high heels and also inequality in length of legs.

Treatment.—After a consideration of what are the exciting and predisposing causes of backache in a given case and an estimation of the general health and of the special disabilities of the patient, one should set about to relieve the painful condition and correct the responsible causative factors. When the pain is acute, the bed is one of the first aids in treatment to consider. It is the splint which immobilizes the back in the non-weight bearing position.

When one is dealing with the arthritic type of backache, the bed treatment is essential, if early and certain results are desired. The bed must be rigid and without sag. This can be made possible by the placing of fracture boards between the springs and the mattress. The normal lumbar curve must be supported in addition by a suitably shaped lumbar pad.

When all inflammatory periarticular exudate has been absorbed and muscle spasm has been relaxed, which may be a matter of ten days to three weeks, then one may consider the matter of some retentive or supporting apparatus in order to retain the normal correction and to prevent any possible subsequent strain. Without this preparatory treatment it is not satisfactory to apply the support.

Any existing foci of infection when present must also be eliminated and if possible autogenous vaccines administered. One often finds that with the removal of such foci as infected tonsils, abscessed teeth, infected antra, an exacerbation of painful symptoms follows for a week or ten days, due to the liberation and absorption of stirred-up infection.

We have obtained better results, as advised by Laming-Evans,[7] relying on the bed treatment during this active phase and waiting until the passive phase before instituting any of the various physio-therapeutic measures.

In simple strains of the sacro-iliac and lumbo-sacral joints rest in the recumbent position and the use of the electric bake oven, or heat otherwise applied produces best results. However, one often finds a patient who will not submit to bed and demands some ambulatory treatment. In such cases the use of strapping with a good stout adhesive plaster gives some comfort. In the sacro-iliac cases this should be applied snugly so as to limit the mobility of this articulation. In the lumbo-sacral type the addition of diagonally placed straps crossing at the site of the lesion and extending from high up on the lateral wall of the chest on one side to the anterior inferior spinous process of the ilium on the opposite side produces a great deal of comfort by preventing rotation. A more rigid support in the form of a plaster cast may be needed in some cases.

When any of the various static or postural defects are present, these should be corrected. In women with pendulous abdomens great comfort is given by wearing a suitable corset. The corset must support and exert pressure upward and backward and it must extend as low as possible and be snugly laced in the lower portion. It is better to have the corsetière fit the corset while the patient is lying and to have the woman always put it on and lace it up while lying.

When pelvic lesions exist alone or in combination with true skeletal lesions the pelvic abdominal or general medical condition must be treated along with the orthopædic fault. The general health of the patient must be cared for and a régime of good hygiene instituted. Fresh air, sunshine, or artificial rays from the quartz lamp, good food and good habits apply to the cases under consideration as well as the special measures referred to.

Clinical Cases

Mrs. A., aged thirty-three.—*Complaints.* Backache, pointed out as situated in the lower lumbar region; aggravated by carrying anything weighty and by twisting body toward the right; relieved by lying on back, and when sitting leaning forward and supporting the arms and chest on the table. The discomfort bears no relation to bowel function, kidney function or menstrual periods. No history of injury. She had influenza recently and has had occasional attacks of quinsy. I might add that this patient had been in for examination

and treatment two years previously, suffering from obstinate constipation and a dull, dragging pain in the right lower abdomen. There were also some menstrual irregularities and dysmenorrhœa. Backache then was not mentioned. After a thorough examination, a diagnosis was made of banded cæcum and atonic colon producing stasis together with left pelvic varicocele. At operation the appendix was removed, the bands of cæcum incised and a double ligation done in the case of the varicocele. Relief from her abdominal complaints was obtained by this surgical treatment.

Evidently some foci were at work other than the bowel to produce the arthritis complained of at a later date.

Examination of the back showed spasm of lower spinal muscles, knees and hips bent when attempting to pick up objects from the floor. Further physical examination of the spine showed the lesion to be of the arthritic type and situated in the left part of the lumbo-sacral joint. A stereo-radiograph showed a cloudiness in this articulation; other portions of the lower spine were negative. Although not suggestive of tuberculous trouble a routine tuberculin test of ten milligrams of O.T. was given without any reaction. Previously, on account of pelvic trouble, a negative Wassermann had been obtained. Checking over the intestinal tract by fluoroscopy with the barium meal and barium enema, it was found normal except that a considerable atony of the colon still remained. Pelvic examination was negative. Heart and lungs, negative. Blood pressure 118-80. Blood, hæmoglobin 80 per cent.; red blood cells 4,520,000; and white cells 11,000. Examination of the urine was negative as well as giving no growth from culture.

Examination of the nose and throat showed the presence of a hidden infection in the crypts of the tonsils which were, by the way, of insignificant proportions. In the light of the raised leucocyte count, the history of recurrent quinsy, and the localized infection in the tonsils, the etiology of the lumbo-sacral arthritis appeared evident. Removal of the tonsils under local anæsthesia was done, and appropriate treatment applied, which resulted in the disappearance of the patient's trouble.

Mr. C. J. Y., aged twenty-three.—Complains of pain and tenderness in the back from the mid-dorsal region to sacrum. He is unable to bend the back when stooping on account of pain and stiffness. In every other respect the patient appeared to be in good health.

This trouble had been present for some two or three years. He gave a history of having had influenza twice, rheumatism a few years previously, and tonsilitis five years before that.

Examination of the spine showed the presence of an arthritis, and muscle spasm was marked from the level of the seventh dorsal down. On account of pain, even the chest muscles were held in spasm, this being productive of shallow breathing and a flattened chest. It was impossible for him to expand his chest. The shoulders were rounded and his posture very defective. Blood examination was as follows: hæmoglobin 80 per cent.; red blood cells 4,820,000; leucocytes 9,800. Examination of the urine was negative. Blood pressure was 140-78. Tuberculin and Wassermann reactions were negative. Barium enema showed that the colon filled normally except that there was some slight delay at the butt of the cæcum. By transillumination tests the sinuses and antra were negative. A radiograph of the teeth showed an abscess at the root of the first right upper molar. The tonsils were infected, particularly the right one. A stereo-radiograph showed marked osteophytic lipping of the third and fourth lumbar vertebra. This at such an early age being a rare condition it was deemed wise to advise subsequent radiographs at intervals of six months. These showed progressive osteoarthritic changes and eventually there was almost a complete bridging between the third and fourth lumbar vertebra, first and second lumbar and also the twelfth dorsal and first lumbar.

The diagnosis was plainly spondylitis, the causative factors most likely were the infected tonsils and the abscess in the tooth. These were removed. He was advised to rest in bed and report later. He was fitted with a Taylor brace and allowed to go about. This, needless to say, gave no relief. After a period of some three months or so, he returned still complaining of the back. The mistake had been made of trying to fit a support to a back with muscles still in spasm, with a chronic arthritis still present producing peri-articular exudate and consequent pain. One must get rid of all this before the retentive support is applied. He was put to bed on a rigid mattress with lumbar pad applied and kept in the dorso-recumbent position for three weeks. During this time he practised deep breathing anl after a while could expand his chest fully and painlessly. When all muscle spasm had disappeared, he was taken to the plaster room, suspended by a Sayer extension apparatus and a plaster of paris jacket applied after the fashion of Calot of Berck-Plage. This was done in January. In April he returned saying he had enjoyed comfort and freedom from pain and had been working in his father's store for two months, and by way of amusement had taken part in some private theatrical entertainments. The cast was removed. Another one was applied using the Sayer's sling also.

In July, the second cast was removed and a brace applied which he wore for another nine months. This was the last heard of him and he reported that he had no pain or discomfort of any kind in his back and that he had been teaching school for some months. He was advised to continue wearing the brace for some little time further.

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Exophthalmic Goitre (Graves' Syndrome) and Involuntary Nervous System.—The belief is held by Harold T. Hyman and Leo Kessel, New York, that exophthalmic goitre is a complicated disease, based on a disturbance in the involuntary nervous system, activated by many sympathomimetic factors of which infection and psychic traumas are examples, and superactivated, so that there is produced a metabolic upset whose origin is obscure—which may be thyrogenic, but which probably is not. An understanding of the steps in the development of the disease may serve to facilitate the study, to evolve new therapeutic procedures and to evaluate the old. The therapeutic desideratum is not yet approached, and should strike back, not at the cause of the metabolic upset, but at the sympathomimetic influences that are at the very basis of this and allied disorders.—*Jour. Am. Med. Ass.*, Oct. 3, 1925.

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THE RELIEF OF CHRONIC PAIN IN THE LOWER SEGMENTS OF THE BODY—BY THE SACRAL EPIDURAL INJECTION

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THE author after treating a series of cases of sciatica by sacral epidural injections, with results that were almost invariably satisfactory, decided, in extension of this principle, to experiment on a series of other conditions involving pain in the lower pelvis and in the lower extremities. The sacral epidural injection was a method introduced separately by Sicard and Cathelin in the first years of the present century for the relief of enuresis, in which it was not very successful. In more recent years this procedure was again made use of in America for the relief of intractable sciatica, generally with much more favourable results.

The Method.—After the usual aseptic preparation, the patient is placed in the knee-chest or knee-elbow position. At the sacro-coccygeal junction are found two points one on each side of the mid-line at the end of the sacrum. A preliminary injection of 2 - 3 cc. of 1 per cent. novocaine is made in the groove between these points. A lumbar puncture needle is then inserted in this groove, for 5 - 7 cm. in an upward direction, parallel to the sacrum and as close to its posterior surface as possible. An injection of 20 cc. of 1 per cent. novocaine is then made into the vertebral canal in which the needle now lies. This is followed by 50 - 80 cc. of sterile saline or Ringer's solution or petrolatum, though the latter is occasionally frowned upon on on account of the fear of fatty embolism and the question of the ultimate disposal of the fluid. The variations in quantity used depend on the size and build of the patient, and more particularly on the resistance encountered by the injected fluid. Usually three injections are given at intervals of a week, and during this period the patient is preferably but not necessarily kept in bed.

In the course of this work there were treated: sciatica, eight cases; lumbo-sacral pain, four cases; rheumatoid arthritis, two cases; locomotor ataxia, two cases; traumatic neuritis, cancer of rectum, amputation stump neuralgia, coccygodynia, encephalitis lethargica, thrombo-angiitis obliterans, and (probably) sacral cord tumour, one case each.

Intractable sciatica.

Of these there were eight cases, in every one of which there was complete or marked relief. In none of them has there been any recurrence though treatment was given from twenty months to three months ago. As some of them have been reported elsewhere,[1, 2] they are only referred to here.

Lumbo-sacral Pain.

Case 9.—J. G., male, forty-five years, tailor. Poorly nourished, chronic bronchitis for many years. In April, 1924, there suddenly developed a severe pain in lower part of back involving the legs to a slight extent. He had been treated in another hospital for eight weeks, where he had been given hydro-electric treatment and then strapped without benefit. The diagnosis there appears to have lain between neurosis and rheumatoid arthritis. In any case, he maintained that his condition had not been relieved. In 1924 he came to the Montreal General Hospital where he was admitted to the neurological clinic.

Examination showed no well-defined sciatica. He seemed to be suffering from lumbo-sacral pain which occasionally shot down into the legs. He was apparently very miserable and shuffled in a manner indicating acute pain in whatever position he assumed. He was given two treatments, which seemed to give him marked relief. On two subsequent occasions the attempt to give him his third treatment failed and in the process he was subjected to considerable pain. He refused to allow any more attempts. Subsequent reports—within a few weeks—were that the pain was almost as bad as ever, and he is now receiving electrical treatment.

Case 10.—M. R., male, fifty years old. In the autumn of 1923 referred from the orthopædic to the neurological clinic of Montreal General Hospital. Very similar to Case 9 in almost all respects, with similar relief for a short time only. Received three treatments.

Cases 11 and 12.—Pain distinctly lumbo-sacral. Nothing found on objective examination. Two treatments each, quite without relief.

Locomotor Ataxia.

Case 13.—L. C., tailor, fifty-four years old. Wife showed some symptoms of lues. Two children, one with congenital lues. Patient's blood + +; spinal fluid, negative Wassermann, globulin and cells. However, he has double vision, ptosis, Argyll-Robertson pupils, which are unequal in size and slightly irregular in contour. He also has girdle sensations and other paræsthesias, Romberg's sign, very ataxic gait, absent knee-jerks, and complains of severe pain across the bridge of the nose, severe lightning pains in legs and some stiffness.

In the neurological clinic of the Montreal General

Hospital during January and February, 1925, he was given three injections, with marked relief after the first and complete disappearance of the lightning pains after the second injection. There has been no recurrence since—now over four months, but he complains of stiffness in his legs.

Case 14.—J. H. G., armature winder, thirty-eight years old. Argyll-Robertson pupils, ataxia in arms (had to give up his job), numbness in ulnar distribution of both hands, no Romberg, knee and ankle jerks present. Intense and almost constant shooting pains in the legs. Blood and spinal Wassermann + +. Noguchi, Pandy and cell count all plus. Given three injections in January and February, 1925, with complete relief of pain in legs so far, a period of four months. Complaint is made of stiffness in the legs.

Traumatic Neuritis.

Case 15.—J. B., male, labourer, thirty years old. After being struck by a bag of flour across the lower back he came to the neurological clinic of the Montreal General Hospital. He shambled in, complaining of great pain in the lower part of back and legs, and weakness of legs.

Examination including spinal fluid disclosed nothing except absence of knee-jerks. There was some difference of opinion about the diagnosis. However, accepting his statements in regard to the weakness and the pain, combined with the definite evidence of the lost knee-jerks, it would seem to be fair to conclude that he is suffering from traumatic neuritis resulting from injury to some of the nerves of the cauda equina. In any case it was decided that he was entitled to a trial, and he was given three injections at intervals of one week. There was a report of prompt and great improvement following the first injection and since the last there has been practically no pain for five months now. His gait was soon restored almost to normal. The weakness and the loss of the knee-jerks were not affected by the treatment.

Coccygodynia.

Case 16.—J. Y. A., woman, forty years old. Suffering from severe pain, tenderness and occasional throbbing at the end of her spine. She dated it from some months before, when after rising from a hassock on a doorstep, she sat down again sharply, and as the hassock had been removed in the interval she landed with some force on the stone step. She felt the pain then but it soon eased off. However, it was far more acute and throbbing the next morning. She was treated by a gynæcologist, and received some sort of injection from a physician, who apparently diagnosed her condition as coccygodynia. Close questioning seemed to indicate that the patient might have been suffering from the condition since her last parturition eighteen months before, but that it had been greatly intensified by the accident.

Examination, Dec. 18, 1924.—A heavy woman with a worn look; unable to sit straight. She sits tilted or sidewise as though to relieve the coccyx from pressure. There was some local tenderness and a delayed and sluggish anal reflex; otherwise nothing was found. A single injection was given and when seen again some weeks later the patient reported almost complete relief from suffering. Declined further treatment and has not been heard from since.

Amputation Stump Neuralgia.

Case 17.—M. F. female, twenty-five years. Has been attending the Montreal General Hospital clinics for years. Had undergone seven operations on right leg for some orthopædic condition, and four others for the relief of pain arising in an amputation stump; all to no avail. She was attending the neurological clinic when the present method was proposed to her and she accepted it willingly. Her complaints included three factors:—(1) Rapid spasmodic movements of the stump of her leg on the thigh which frequently annoyed her in the day time and woke her several times a night. (2) Frequent lightning pains in the limb during the day and night. (3) An intense tenderness at one angle of the sutured stump that nearly drove her crazy when it was touched.

In January and February, 1925, she was given three weekly injections with partial relief after the first and complete relief after the third injection. At the end of May she complained of some recurrence of the tenderness only, which disappeared immediately after another injection and has not recurred in the three weeks since.

Thrombo-angiitis Obliterans.

Case 18.—Male, tailor, Jewish, excessive cigarette smoker. Diagnosed by his physician as above. His condition started a year ago with pain in the left big toe. He attributed this to an ingrowing toenail, which was removed. Under this there was another extremely thin nail. The pain has become progressively worse and now is in the other big toe. His feet are cold and bluish. In March, 1925, the patient was given two injections. After the first, pain though somewhat diminished, extended even higher up the legs. After submitting to a second injection he reported very decided improvement, with pain replaced by a sort of numb feeling. Early in June I learned from his physician that his pain is definitely returning.

Cancer of Rectum.

Case 19.—Woman, fifty-two years old, suffering from cancer in the rectum, apparently involving the sphincter and lower sacrum. She suffers from severe pain, retention and partial incontinence of fæces. She was about to be put on morphine, when I volunteered to try this method. I gave one injection in April, 1925, but did not repeat it on account of the difficulty of the procedure owing to involvement of sacrum. Her physician informs me that this treatment was sufficient to stave off the use of morphine for some weeks.

Encephalitis Lethargica.

Case 20.—L. B., forty-nine years old, attending the neurological clinic at M.G.H.—a bad case of encephalitis lethargica with many symptoms, and complaints of severe pains in the legs. Here no relief was expected but it was thought that since this method is effective in giving relief to peripheral pain below a certain segmental level, it might serve as a means of distinguishing between central and peripheral pain. He was given one injection in April but this proved of no avail.

Rheumatoid Arthritis.

Case 21.—Mrs. M., about fifty years old. Western Hospital (Courtesy of Dr. W. Reilly). Rheumatoid arthritis of long standing. Pain in the arms and front of the thighs (second and third lumbar distribution). Given two injections in February or March, 1925. No relief whatever.

Case 22.—Mrs. A. M., forty-five years old. Sufferer from rheumatoid arthritis for many years. Has been through the routine of treatments many times both in Canada and in U.S.A., never with any lasting relief. Pain is constant with periodic exacerbations. Fingers crooked and knotted, hands deviated at wrists, knees knobby and ankles look like budding potatoes. Pain is constant in the upper limbs, but not very severe. In the lower limbs she states she has two different kinds of unbearable pain, one constant and the other inter-

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mittent. She was given three injections in February, 1925, with almost complete relief in lower limbs, particularly in the ankles (fourth and fifth lumbar and first and second sacral distribution). In fact for the past four months she has been able to hobble around, which she had been unable to do for many months before.

Sacral Cord Tumour.

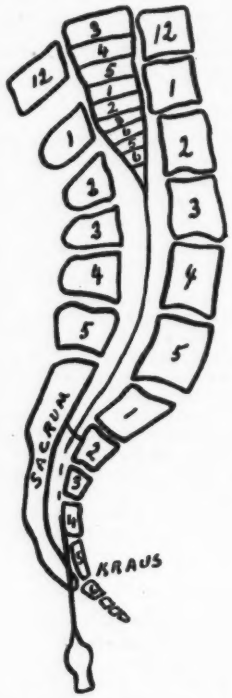
Case 23.—Man, thirty-eight years old. Suffered from pain at first slight and intermittent, then progressively increasing and constant in the lower part of his body and limbs for the past eighteen months. Lately he has complained of progressive though not marked weakness of the lower limbs, associated with some stumbling in walking and difficulty in starting micturition.

Examination May 12, 1925.—Right knee and ankle jerk gone, left diminished. Sensation to cotton diminished over the whole right limb and over the heel and dorsum of the left foot. Sensation to pin-prick diminished diffusely over both limbs. Sensation to heat and cold distinctly confused over the same areas. Romberg and heel to knee tests do not give satisfactory responses. No hyperæsthesia. No obvious atrophy. Lumbar puncture fluid is slightly xanthochromic, ten cells; Wassermann negative; globulin distinctly increased. Given two injections and the pain has been so decidedly relieved for the past four weeks that the patient, who had practically agreed to operation, is now procrastinating.

Comments.—In the fourth treatment of Case 17, an attempt was made to see how far up the vertebral canal the injected fluid would go. It was hoped that a 10 per cent. solution of sodium bromide would be sufficiently impervious to the x-rays to solve this problem. Following the preliminary 20 cc. of novocaine solution, 60 cc. of a 10 per cent. solution of sodium bromide was then injected and several x-rays taken. This test, however, was less successful as a test than as a treatment, although the patient did feel some temporary general discomfort from the substitution of the bromide for the usual Ringer's solution. Probably a 10 per cent. solution of sodium iodide, being of much greater atomic weight than the bromide would be more likely to cast a shadow. It would, however, require 6 gm. of the drug—a rather risky dose for a mere test.

The failure to produce any effect in the case of encephalitis was to be expected, but the favourable result in the locomotor ataxia cases was rather surprising. This can perhaps be explained by the fact that the ganglia of the posterior roots being partly outside the theca—the cerebro-spinal sac—are capable of the same reactions to the injected fluid as the nerves of the cauda equina.

The lumbo-sacral cases in general and one of the rheumatoid arthritis cases were not helped. In these cases the pain arises from involvement of the higher lumbar nerves, in the other cases from the lower lumbar and the sacral nerves. The implication here is that this method is more effective in the lowest segments of the spinal innervation, say from the third or fourth lumbar down. The injection is not into the cerebro-spinal canal, but into the (sacral) vertebral canal outside of it.



This method is not a cure-all, nor a cover for defective examination. It is merely directed to relieve pain not removable by simpler measures, though in many of the cases to relieve the pain is tantamount to curing the condition.

Summary and Conclusions.—This method of treatment was remarkably effective in its results in the sciaticas, the locomotor ataxias, the amputation stump neuralgia, the traumatic neuritis, and the coccygodynia, and was definitely beneficial in the case of rectal cancer, the thromboangiitis obliterans, the sacral cord tumour, and the lower arthritis deformans case. Lack of available material prevented the author from trying out a series of other conditions. It seems reasonable to suppose that many other painful conditions in the lower segments of the body may be similarly helped, e.g., cancer, kraurosis vulvæ, peri-anal prurigo, multiple neuritis, etc.

and it is recommended that these be tried out.

Though the series is neither extensive nor of long duration it has proved of such value that it may well be an incentive towards further investigation along similar lines.

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THE COLLOIDAL GOLD REACTION OF THE CEREBROSPINAL FLUID

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ONE of the most important laboratory methods for the study of the cerebrospinal fluid is the colloidal gold reaction of Lange.[16] While trying to apply to the cerebrospinal fluid the discovery made by Zsigmondy[31] that solutions of proteins protect a colloidal gold solution from precipitation, Lange found to his surprise that if a pathological cerebrospinal fluid is diluted with a weak solution of sodium chloride and then a constant amount of colloidal gold solution added, not only do the proteins of the fluid fail to protect the gold solution from precipitating but precipitation occurs, while no precipitation occurs if the cerebrospinal fluid is normal. Moreover, the author noted that the maximum degree of precipitation takes place in definite dilutions in some special morbid conditions of the central nervous system. Thus precipitation occurring in the lower dilutions of a progressive series bespeaks a paretic condition, and a precipitation limited to the middle dilutions a cerebrospinal lues, while a precipitation manifesting itself only in the higher dilutions (''Verschiebung nach oben'') bespeaks a meningitis of non-luetic origin.

The fact that the colloidal gold solution, according to the degree of its precipitation, passes through a number of colour changes, first suggested to Lange the idea of expressing this precipitation by three different curves, later called the paretic, the tabetic and the meningeal. Still later, Lee and Hinton[17] substituted figures to designate the various degrees of precipitation manifested by the various shades of colour changes in the gold solution as follows: 0, the original red or no change; 1, slight change in red; 2, red-blue; 3, violet; 4, water blue; 5, clear water or complete precipitation. Thus an aggregate figure like 5555400000, meaning a precipitation in the first five tubes, stands for a paretic curve; 0045554000 a tabetic curve or mid-zone precipitation and 0000055555 a meningeal curve or precipitation in the last five tubes.

Since the introduction of this valuable reaction, the literature on the subject has become very voluminous and, although opinions seem to vary in regard to minor details of technique and interpretation, yet, the consensus of opinion is that the value to the clinician of the colloidal gold reaction in detecting and differentiating a luetic from a non-luetic condition of the central nervous system is unquestionably great, not only for an early diagnosis but also for the prognosis of obscure nervous cases. Among the authors who claim importance for the reaction in general paresis are Miller and Levi,[20] Hammers,[13] Black, Rosenberg and McBride,[2] Ramsay and Fidlar,[23] Solomon, Koefod and Welles,[26] Lowry,[18] Mellanby and Anwyl-Davies[19] and Swahn and Mann[27] who found a paretic curve in 90 per cent. of their cases of paresis. While there is some slight disagreement among authors regarding the reliability of the reaction in cases of tabes and cerebrospinal syphilis, still the majority, including also Swahn and Mann[27], Oetiker[21] and Hammers,[13] agree that a mid-zone precipitation, if not warranting a clear-cut diagnosis of tabes or of cerebrospinal lues, always

points definitely to a severe luetic condition of the central nervous system, while a marked mid-zone precipitation makes the diagnosis of tabes probable. As Solomon, Koefod and Welles[26] say, "When a syphilitic fluid does not give the strong paretic reaction, it is good presumptive evidence that the case is not general paresis and this test offers a very valuable differential diagnostic aid between general paresis, tabes and cerebrospinal syphilis." The same may be said for the meningeal curve, which is also vouched for by the majority of authors, as, for example, Ramsay and Fidlar,[23] Solomon, Koefod and Welles,[26] Grulee,[11] Oetiker[21] and Lee Hinton[17].

This reaction applies also to the diagnosis of obscure congenital syphilis in which, according to Grulee and Moody,[11] there is, as a rule, a mid-zone precipitation but, at times, the degree of precipitation may be so great as to give a paretic curve. Fay[7] says, "The colloidal gold reaction should *not* be considered as purely a test for syphilis, for many conditions give characteristic curves which are quite different from those found in tabes or paresis." Riddell and Stewart[24] say, "In neuro-syphilis, it gives results which rival in value those of the Wassermann reaction and its employment as a diagnostic aid in many non-syphilitic diseases has a wide sphere of utility which even at the present day does not appear to be fully appreciated."

The peculiar place occupied by this laboratory method in differentiating a luetic from a non-luetic pathological condition of the central nervous system and particularly the claim that by means of this reaction it is possible to differentiate general paralysis from other neuro-syphilitic affections, induced me to carry out this research, with the aim not only of confirming or disproving previous findings regarding this reaction, but also of testing the sensitivity of colloidal gold solutions prepared both by the original method of Zsigmondy as modified by Lange, and by the latest method of Mellanby and Anwyl-Davies.

Preparation of the colloidal gold solution.—Lange's modification of the original method of Zsigmondy for the preparation of the gold solution is the following. To a Jena flask containing 1000 c.c. of absolutely fresh double distilled water, 10 c.c. of a 1 per cent. solution of gold chloride and 10 c.c. of a 2 per cent. potassium hydroxide solution are added. As soon as the mixture reaches the boiling point, very quickly, yet drop by drop, 10 c.c. of a 1 per cent. solution of formaldehyde is added. The flask is at once removed from the flame and vigorously shaken. In a short time, the mixture assumes a rose colour, which gradually changes into a beautiful deep red.

This seemingly simple way of preparing the gold solution, even in the hands of the most skilled workers, is unreliable. For inexplicable reasons, the solution is as often as not a failure. This fact has naturally given rise to numerous attempts to render the original method more exact. These modifications, introduced by Eicke,[4] Oetiker,[21] Shaffer,[25] Grey,[10] and Bernard,[1] who claims to have had good results in preparing the colloidal gold solution by the electrical method, no doubt have a great influence on the sensitivity, uniformity and deduction of results. However, even with all these modifications, marked difficulties have been encountered by the majority of experimenters in obtaining an ideal colloidal gold solution. The unreliability of the reagent, even when the solution obtained is apparently of the right colour but lacks the proper degree of sensitivity, as found by Eskuchen[6], Flesch[8] and many others, has hindered the work of the pathologist in this direction and has led to the substitution of other simpler colloidal reactions as, for example, the mastic test proposed by Emanuel[5] and the benzoin test of Guillain, Laroche and Lechelle.[12] These, however, lack the fine degree of sensitivity of the gold solution.

An important factor, apparently overlooked by previous authors in the preparation of such solutions, is the reaction of the reagents employed therein. This formed the basis of study and of a new technique, proposed by Mellanby and Anwyl-Davies,[19] which led to the preparation of a stable and uniform gold solution possessing the necessary sensitivity. Their method, which is very simple, is the following. "To 100 c.c. of freshly double distilled water, 1 c.c. of 1 per cent. neutral potassium oxalate is added and the fluid is heated to the boiling point. Whilst boiling, 1 c.c. of 1 per cent. gold chloride solution is added drop by drop. Within half a minute a magnificent red solution of colloidal gold is obtained." To test the sensitivity of their modification, the authors made a comparative study of acid and of

alkaline gold solutions and found that while the acid solution increases the sensitivity of the colloidal gold towards precipitation, alkali diminishes it, so that a normal cerebrospinal fluid made to react with an acid or with an alkaline solution may give rise, respectively, to a false reaction simulating a paretic or tabetic curve, while only a neutral gold solution gives a negative reaction. The slightest amount of acid (N/2500) or of alkali has a detrimental action on the sensitivity of the colloidal gold solution. Thus it is easily understood how the reaction of the reagents is the most important factor in the preparation of the solution. The use of chemically clean glassware, the absolute exclusion of any acid or alkali from the distilling apparatus and from the receptacles, the use of fresh double distilled water and, above all, the neutrality of the reagents required are of the utmost importance in obtaining a reliable solution.

The Test.—The test is of a very simple nature. The gold solution, before use, must be tested as to its efficacy and sensitivity against a normal and against a known paretic cerebrospinal fluid. The only other reagent required, besides the neutral gold solution, is a 0.4 per cent. NaCl solution. Working with half quantities, 0.9 c.c. of NaCl solution is put in No. 1 of a series of eleven test tubes and 0.5 c.c. of the same is put in each of the remaining ten tubes. To the first test tube 0.1 c.c. of the suspected cerebrospinal fluid is added. After the fluid in test tube No. 1 is well mixed, with a 1 c.c. pipette 0.5 c.c. of diluted cerebrospinal fluid is removed and transferred to test tube No. 2 and by repetition of the same procedure, 0.5 c.c. is transferred from tube No. 2 to tube No. 3, and so on throughout the series of ten tubes, the superfluous 0.5 c.c. from the tenth tube being discarded. To all test tubes now containing the progressive dilutions of cerebrospinal fluid from 1:10 to 1:5120, (with the exception of the control test tube No. 11, which contains only 0.5 c.c. of NaCl), 2.5 c.c. of the neutral colloidal gold solution are added. The tubes are shaken and left at room temperature. Although in most cases the reading may be done in two or three hours, the final reading should not be done until after twelve hours, by which time, in an abnormal fluid, the maximum precipitation of the gold solution will have taken place.

To explain the precipitation of the gold solution by a pathological cerebrospinal fluid, several causes have been suggested. Lange maintained that it is due to an increase of the protein complex; Jaeger and Goldstein[14] put it in relation with a purely physical change of the cerebrospinal fluid; Weston[29] that the precipitating substance is a globulin, which may be precipitated by ammonium sulphate and destroyed by heat. Mellanby and Anwyl-Davies[19] see in it a play of colloids oppositely charged. These two authors think that the positively charged colloid is a euglobulin, the negatively charged a pseudoglobulin; that in a normal cerebrospinal fluid the two globulins are in small quantities and in balanced proportions; that the euglobulin is increased to a moderate extent in cerebrospinal fluid that shows a tabetic curve and to a greater extent in one that exhibits a paretic curve. Quite recently Wright and Kermack[30] and also Schaffer[25] have suggested that the precipitation of the gold solution is dependent on the hydrogen-ion concentration of the spinal fluid and of the colloidal solution used.

In this research I have made use of gold solutions prepared both by Lange's method and by that of Mellanby and Anwyl-Davies. By observing the most scrupulous technique, using a high-grade conductivity water prepared in quartz stills, and employing a fresh neutral solution of formaldehyde (Merck), success was achieved in preparing good gold solutions by Lange's method. At the same time there were several failures, doubtless traceable to some slight variation in the reaction of the reagents. On the other hand, with the method of Mellanby and Anwyl-Davies, which naturally also requires great care, the preparation of a good gold solution is simple and practically always obtainable. Very rarely the solution assumes those various nuances of red or of violet which are so common with Lange's method. The gold solution obtained with the Mellanby and Anwyl-Davies method is of a clear cherry red; it keeps well and is very sensitive to the action of cerebrospinal fluid.

The estimation of the globulin was done according to Pandy's[22] method which, owing to its simplicity and accuracy, is in my mind preferable to the Nonne-Apelt Phase I, the Ross-Jones or the Noguchi. For the cell count the Fuchs-Rosenthal chamber method was used. The Wassermann reaction was performed using grad-

uated dilutions of the fluid and according to the original method as advocated by the Medical Research Committee[15] and adopted by me in previous researches.[9]

The cases in the following table are taken from a larger series of cerebrospinal fluids examined by means of the colloidal gold reaction.

Case No.	Name	Clinical Diagnosis	Cell Count	Globulin	Colloidal Gold Reaction	Wassermann Reaction
1	A. F.	General Paralysis....	10	++	4444420000	+++
2	S. E.	" "	22	+	4444432000	+
3	H. H.	" "	12	++	5555543000	+++
4	A. F.	" "	27	+++	4444432000	+++
5	C. P.	" "	120	+++	4444421000	+++
6	F. B.	" "	9	+++	5555543100	+++
7	T. F.	" "	12	+	4444442000	+
8	D. R.	" "	26	+++	4555400000	0
9	A. P.	" "	31	+++	4455400000	++
10	Mrs. R.	" "	50	+++	5555400000	++
11	T. G.	" "	37	+++	5555500000	+++
12	L. D.	" "	40	++	5555500000	+++
13	R. F.	Tabo-paresis..	15	+++	4444400000	++
14	D. F.	" "	27	++	3555000000	+++
15	E. L.	Tabes dorsalis.	40	+++	0145430000	+++
16	P. W.	" "	32	+++	0134543000	+++
17	B. F.	" "	80	++	0244430000	+++
18	A. J.	" "	60	+++	0024420000	+++
19	B. W.	" "	500	+++	0235433200	+++
20	S. E.	" "	13	+	0344440000	0
21	L. H.	" "	15	++	0034442000	+++
22	D. M.	" "	13	+	0144410000	+++
23	C. P.	" "	25	++	0045500000	++
24	L. T.	" "	18	+	0443000000	+++
25	Mrs. B.	" "	34	+	0033440000	++
26	G. E.	" "	500	+++	0014554000	+++
27	J. R.	Cerebrospinal Lues.....	12	+	0033300000	+
28	McD.	" "	30	++	0033300000	+++
29	MacI.	" "	20	++	0223300000	+++
30	B. P.	" "	12	++	0023200000	+++
31	L. T.	" "	20	+	0343000000	+++
32	M. P.	" "	10	+++	0333000000	+++
33	C. T.	" "	8	+	0333300000	++
34	Mrs. H.	" "	12	++	0222000000	+++
35	F. H.	" "	8	+++	0022200000	+++
36	F. M.	Primary Lues	3	0	0000000000	0
37	J. L.	Secondary "	4	0	0000000000	0
38	F. J.	" "	5	0	0000000000	0
39	F. L.	Syphilis latent	5	+	0000000000	0
40	C. F.	T.B. Meningitis.....	250	+++	0000055555	0
41	Miss P.	" "	83	+	0005555555	0
42	L. D.	" "	65	++	0000455555	0
43	A. E.	Epilepsy.....	1	0	0000000000	0
44	W. S.	Trans. Myelitis.....	9	+/0	0000000000	0
45	A. R.	Facial Paralysis.....	2	0	0000000000	0
46	F. E.	Rheumatism..	9	0	0000000000	0
47	B. F.	Psycho-neurosis.....	2	+/0	0000000000	0
48	P. O.	Diss. Sclerosis.	16	+++	0344300000	0
49	T. C.	Dementia præcox.....	2	++	0022330000	++
50	L. P.	Gonorrhœa...	2	0	0000000000	0
51	M. R.	" "	1	0	0000000000	0
52	MacN.	" "	3	0	0000000000	0
53	J. T.	" "	1	0	0000000000	0

In my experience, treatment seems occasionally to influence the results of the colloidal gold reaction by slightly decreasing the intensity of the precipitation, although usually it remains unchanged, as has also been noted by De Crinis[3] and by Warwick.[28] I have also found cerebrospinal fluids obtained from cases clinically diagnosed as general paralysis which have given a negative result not only to the colloidal gold reaction, as was also noted by Riddell and Stewart,[24] but to others and especially to the globulin test, as noted also by Pandy.[22]

In conclusion I may say:

1.—The colloidal gold solution prepared according to the method of Lange has, on the whole, shown itself less constant in properties than the one prepared by the method of Mellanby and Anwyl-Davies, although a perfect Lange solution, once achieved, gives equally good results.

3.—Owing to their ease of preparation and to their relatively constant sensitivity and reliability, colloidal gold solutions prepared by the method of Mellanby and Anwyl-Davies are to be preferred to solutions prepared by other methods and might well be adopted as standard solutions.

3.—While general paralysis and non-luetic meningitis give, as a rule, a quite specific curve, mid-zone curves, as obtained in tabes dorsalis and cerebrospinal lues, are less uniform, although they are apparently always indicative of a luetic lesion of the central nervous system.

The expenses of this research were partly defrayed by a grant from the James Cooper Fund of McGill University.

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EPIPHORA AND CATARRHAL AFFECTIONS OF THE NOSE, WITH THEIR TREATMENT

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EPIPHORA, save in those cases of inflammation of the punctum and canaliculus, or of constriction and displacement of the punctum, is usually due to nasal catarrh affecting the lower end of the nasal duct, thereby giving rise to swelling, impeding more or less completely the outflow. When this has been present a variable length of time, the danger of an acute catarrh of the nostril giving rise to inflammation of the lacrimal sac, is ever an imminent risk. If this danger were realized, then disease of the lacrimal sac and all its complications would gradually become a thing very seldom encountered. All such cases of epiphora are to be remedied by applications to the nose and throat so as to do away with any inflammation present. With proper treatment the results are quite satisfactory. When an operation is done for muco-purulent inflammation of the lacrimal sac, it is often unsatisfactory though the probe has made a clear opening through. This is due to the opening of the nasal end of the duct remaining swollen and blocking the exit, as the nasal catarrh has never been properly treated. Hence, though the duct was dilated with a big probe, there remained a watering of the eye, owing to the swollen nasal end, and all that was needed was not the constant use of the big probes, but treatment of the nose. Moreover, the flaring up of the lacrimal sac, after a period of quietude, in these cases, was caused by the untreated swollen condition of the nasal membrane and nasal end of the duct, this latter especially being a favourable seat for acute inflammatory attacks. Purulent inflammation of the lacrimal sac entailing operation would be a rarity, were the nose properly attended to in cases of epiphora.

Those who so strongly advocated the employing of very large probes made a mistake, and reasoned wrongly, and have been the means of making the public willing to endure suffering rather than submit to a treatment which was so painful. After all, it was very often quite unsuccessful in stopping the epiphora, and hence our treatment of tear-passage troubles was in bad repute among the public, and deservedly so. I submit that the operation for the removal of the sac would not be needed, except in badly neglected cases, were the nose properly attended to. By proper attention, I do not mean the removal of spurs and parts of the turbinated bones, which is necessary in some cases, but the treatment by applications to the whole interior of the nose and vault of the pharynx for many months twice weekly, if the catarrh be of long

standing. Even if an operation for spurs, etc., is performed, this treatment has to be used, if the best result is to be obtained. If a very sensitive point is found in the nasal passages it should be obliterated, as it is often a cause of delay in recovery.

If bad colds of the nose and head were recognized as a local acute inflammation, and treated by local applications, which give immediate relief, we would strike at the root of nasal catarrhal troubles. Instead, these colds in the head are allowed to wear themselves out. Thus repeated colds of the nose, wrongly treated, eventuate in catarrh. The constitutional symptoms are more directly and sensibly treated by local applications than by constitutional remedies, and the response is more rapid in every way; for the cause of the fever is the toxic state of the nose, except in some special cases.

The mode of treatment which I have found very satisfactory in cases of nasal catarrh affecting the lacrimal passages and the Eustachian tubes, and all cases of acute cold in the head, has been as follows:—By means of the applicator, first I apply freely a solution (one in three thousand) of epinine or adrenaline to each nasal passage; then I make a thorough application of 35 per cent. argyrol, or of neo-silvol in the same strength, to the vault of the pharynx through the mouth. A second application is then made to the nostrils of one of the latter remedies. The neo-silvol I use more frequently than the argyrol unless the argyrol seems to be the more suitable. This I repeat twice weekly. In acute colds of the head, especially with deafness and ear uneasiness, I use these applications every day for several days, until relief is obtained; then twice weekly, and when better, once weekly. As a spray the patient is given an oil preparation.

Till I employed this very satisfactory method of treatment and got such good results, I was not aware what far-reaching effects the disease had. With the cure of the catarrhal cold there is a great feeling of relief in the head, many odd aches and pains disappear, and the patient feels mentally brighter. The mental lethargy frequently associated with an attack is apparently due to loss of the normal equilibrium of pressure upon the brain, consequent upon the blocking more or less completely of the nasal ends of the various passages from the nose. Pain and stiffness in the back of the neck, and the swollen condition of the nose and face, both present in long standing chronic catarrh, also subside.

In patients who suffer every winter from bronchitis and bronchial asthma, I have found that after the use of this treatment those conditions no longer occur, or do so only in a minor degree; whereas previously, various forms of treatment had been of no avail, or at least only gave transient relief.

In atrophic catarrh this treatment has a gradual revivifying and soothing effect, with a permanently curative action, if persevered in.

In my opinion this form of treatment will also gradually lessen the necessity of operative interference upon the turbinated bones, and upon the various sinuses in connection with the nose. I may add that I have been using this form of treatment for many years, having given up the treatment usually relied upon, on account of the unsatisfactory results I previously obtained.

The Value of Spinach.—H. Leclerc, (*Presse méd.*, September 12, 1925, p. 1229) points out that spinach is relatively rich in nitrogenous substances, in hydrocarbons, and in iron sesquioxide, which last amounts to 3.3. per cent of the total ash. It is thus more nourishing than other green vegetables. Leclerc considers that it also has claims to form part of the diet in anæmia, not only on account of the contained iron, but also of the chlorophyll. Chlorophyll is known to have a chemical formula remarkably similar to that of hæmoglobin, and it is stated that the ingestion of chlorophyll will raise the hæmoglobin of the blood without increasing the formed elements. The plant contains from ten to twenty parts per 1,000 by weight of chlorophyll. During the war wine fortified with spinach juice (1 in 50) was given to French soldiers weakened by hæmorrhage. The author adds that this vegetable is contraindicated in patients with a tendency to gravel, because it is rich in oxylates. It is usually well digested; the percentage of cellulose present is only 0.87.—*Brit. Med. Jour.*, Oct. 3, 1925.

ETIOLOGY OF COUGH*

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COUGH is merely a symptom of disease. Its successful treatment requires that its source be discovered. This source is often obscure owing to the fact that cough is in most instances of reflex origin. As a symptom, cough differs from pain in that it can be influenced or wholly produced by voluntary impulses (artificial cough employed in chest examinations).

The automatic mechanism of cough is governed by centres in the spinal cord and medulla. In reflex cough the vast majority of afferent impulses are conducted by the widely distributed branches of the vagus, but stimuli from the skin, the external auditory meatus, and from the brain can cause cough. For example, an impulse arising from the sensitive mucous membrane just below the vocal cords is often powerful enough to pass through (overflow) the medullary centre into the cerebrum and give rise to the sensation in the throat of tickling, distress, or even pain in the larynx. In such a case the resulting cough is conditioned by impulses arising in the cerebrum and becomes a more or less volitional act. A purely artificial cough is the result of cerebral impulses only.

The cause of cough may be found in: (1) Irritation of the mucous membrane of the respiratory tract; (2) pleural irritation; (3) circulatory congestion of respiratory areas secondary to myo-, endo-, or pericardial affections or aortic disease; (4) mediastinal abnormalities; (5) irritation of the lower surface of the diaphragm; (6) irritation of external auditory canal; (7) direct irritation of the medullary centre by local disease.

1.—*Affection of the respiratory tract* is a broad term which requires the inclusion of such clinical entities as affections of the accessory sinuses, teeth, tonsils, uvula, pharynx, larynx, the trachea and bronchi; also the numerous acute and chronic inflammatory alterations in lung structure due to the various infections as well as the pulmonary manifestations of protein allergy and dust inhalation.

2.—*Pleural cough* is usually caused by some degree of inflammation and may or may not be accompanied by pain. When painful we know that both cough and pain can be greatly relieved by strapping the chest wall and it is suggested that since the paroxysmal cough of advanced tuberculosis can also be relieved by strapping it may be caused in part by a painless pleural involvement. Kohts[1] found that electric or mechanical irritation of the parietal pleura can cause a dry cough with a violence directly proportional to the area of pleura involved and clinical evidence of this is frequently afforded when the pleura is punctured during thoracentesis. A cervical rib may provide sufficient pleural irritation to cause cough and another source may be an echinococcus cyst which has reached the pleural surface. In some cases of early tuberculosis with apical involvement it may be observed that a cold hand placed on the skin of the diseased side will elicit a dry cough. When placed on the skin of the sound side there is no such response.

3.—*Cough due to disturbed pulmonary circulation* is sometimes overlooked especially the slight unproductive cough associated with early endocardial defects in young adults. This cough seldom causes any anxiety on the part of the patient or his family and may be negative on both physical and x-ray examination. The administration of digitalis is frequently followed by the disappearance of the cough. Myocardial insufficiency which is usually found in patients past middle age, causes a more marked and productive cough. Although a low-grade bacterial infection of the bronchi is frequently a silent partner in the condition, the circulatory embarrassment is the dominant factor. It is commonly known as "winter cough" and lessens or disappears during the warm weather months or if the patient should winter in the south. The explanation is that during the winter the patient

*Read before The Canadian Medical Association, Regina.

lives in an overheated home and is thereby rendered over sensitive to the winter chill of outdoors. The resulting inadequate elimination and repeated constriction of peripheral vascular areas throws a heavy load on the weakened heart muscle. This in turn produces pulmonary venous congestion and a chronic cough. The milder forms of this condition may occur without giving rise to either physical or x-ray signs. The violent paroxysms of pulmonary edema need only be mentioned but there is an infrequent but well known form of circulatory cough caused by pressure on the vagus by an extensive pericardial effusion.

4.—*Irritation of the under surface of the diaphragm* can cause cough. The usual source is an ascending infection which may be derived from the gall bladder, a subphrenic abscess, a penetrating gastric or duodenal ulcer, the appendix or even a pus tube. In the more severe forms of infection the upper surface of the diaphragm may become involved and a pleural cough be added. Pronounced pressure on the under surface of the diaphragm by any large abdominal tumour may give rise to cough.

The question of a "stomach cough" is still debatable inasmuch as it has not been produced experimentally. None the less there would seem to be grounds for supposing that gastro-intestinal iritation from indigestible food can cause cough when one recalls the magical effect in children of an emetic or a dose of castor oil. The same supposition applies in the case of round worms. There are observers who maintain that paroxysmal cough can be caused by irritating conditions of the cervix uteri in women with a hypersensitive nervous system.

5.—*Mediastinal cough* may be caused by pressure or traction on the vagus or recurrent laryngeal nerve and by a chronic bronchitis resulting from the pressure of a new growth. Any of these factors may cause severe paroxysmal cough and in the case of bronchial pressure there may be marked stridor on inspiration. The most frequently found causes in adults are intra-thoracic goitre and thoracic aneurism. In children we look for enlargement of the thymus and tracheobronchial glands.

6.—*Irritation in the external auditory canal* may be the unsuspected source of a severe and persistent cough. The exciting agent may be either direct inflammation of the mucous membrane or a foreign body. In the case of a child a violent persistent cough without physical signs or the history of a cold always calls for examination of the external auditory meatus. This cough is interesting because the reflex pathway is not the pneumogastric but the auriculo-temporal branch of the fifth nerve.

7.—*Direct irritation of the medullary centre* by adjacent disease of the brain may be a cause of cough as in tuberculous and other forms of meningitis, brain abscess and brain tumours.

Character of Cough.—The character of a cough may provide a clue to its cause. In this respect coughs may be broadly divided into two classes—expectorant and irritant. The expectorant cough has a purpose and should be aided. The irritant cough serves no good purpose and should be suppressed.

Both types of cough have their characteristic sounds which may be distinguished by the listener, even though both be occurring in the same patient. The sounds of an expectorant cough are invariably linked together, and once begun this cough can be checked only with difficulty until it ends with the characteristic sound of the expectoration entering the pharynx. Striking examples of productive cough may be found in advanced lung abscess or bronchiectasis.

The sounds of an irritant cough on the contrary are independent and may be likened to separate blows of a hammer.

Tuberculosis unfortunately has no characteristic cough. The loud cough which alarms the public is not likely to be due to tuberculosis except in the far advanced and unmistakeable stage. The slight persistent morning cough accompanied by a mild tickling sensation and small amount of sputum is often of great significance and yet seldom receives attention from either patient or physician. Frequently the patient denies its existence. The character of cough in tuberculosis is governed by such widely divergent factors as type, degree, and extent of reaction, area of involvement, presence or absence of cavities, etc.

The paroxysms of whooping cough contain the elements of both productive and irritant cough and form a connecting link between the two classes.

The irritant cough not only fails to serve any useful purpose but if unchecked may be danger-

ous. The ill effects of unchecked severe irritant cough may induce complications during early stages of influenza, spread pleural infection in pneumonia, aggravate pain, cause loss of sleep, tax the circulatory apparatus, interfere with normal filling of the heart and produce local hæmorrhages.

The experiments of Kohts[2] show that the most sensitive area of the respiratory mucous membrane is that underlying the vocal cords and is such that sustained irritation here can cause convulsions. This fact may account for the convulsions sometimes seen during whooping cough. The irritability of the trachea diminishes downward until the first division of the bronchi is reached. Here it becomes more pronounced. From here downward susceptibility decreases and finally disappears in the smallest bronchi.

The well known "croupy cough" is the result of irritation of the sub-glottic area and in cases of cough during diphtheria, laryngeal paralysis, and tuberculous erosion of the vocal cords the paroxysms originate in the same area, but the character of the cough is entirely different. It is loud but flat and toneless because of imperfect closure of the glottis. A similar type of cough occurs after accidental injury to the recurrent laryngeal nerve during thyroidectomy.

Simple dryness of the throat can cause reflex cough and there is reason to believe that these reflexes exaggerated, cause the barking hysterical cough. The "gander honk" of aneurism of the arch or intra-thoracic goitre is caused by compression or stretching of the recurrent laryngeal nerve with spasm of the glottis.

A thyrotoxic cough is described by Crotti[3] and Sattler in certain cases of hyperthyroidism. It is a dry cough, more troublesome on lying down, and is ascribed by them to an increased irritability of the respiratory mucous membranes. Calcareous concretions in the lung may cause a severe spasmodic cough which is diagnosed only when the patient brings the "lung stone" to his doctor.

Foreign bodies may be aspirated without the patient's knowledge, or in the case of infants and may give rise to a spasmodic cough. The diagnosis may be difficult and possible only after long observation with the aid of serial x-ray films. The cough is dry and hacking and becomes productive only in the event of abscess formation. Mitral stenosis is sometimes diagnosed for the first time when the harassing cough of beginning decompensation brings the patient for relief from the associated bronchitis. Ptosis of the liver can cause a dry cough which has the characteristic of ceasing after the patient lies down. Peri-hepatitis has a cough which is sometimes elicited only by manipulation of the liver.

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(1) Quoted by THOMSON, *Treatise on Clin Med.*, 1914. (2) *Ibid.* (3) CROTTI, *Thyroid and Thymus Bk.*, 1918.

Perirenal Sclerosis (Chronic Cicatrizing Perinephritis).—Vincent J. O'Conor, Chicago, reports two cases of perirenal sclerosis occurring as a sequel to perinephritic abscess. The patients were young men. The symptoms of renal compression became severe several years after an apparently successful drainage of a right perinephritic abscess. Both patients complained of a dull lumbar pain, which was localized and did not radiate to the abdomen, groin or thigh. In each instance the pain was markedly increased when the daily fluid intake exceeded three quarts. The pain became acute and sedatives were required when a quart of fluid was taken during a two-hour period. The only objective finding was a deficiency of function on the affected side. There was no evidence of stone, tumor or urinary obstruction, and the ureteropyelograms were normal. This unilateral diminution of renal function was evidenced by a fixed low specific gravity, a lessened excretion of urea, chlorids and total solids, and a retarded phenolsulphonephthalein excretion. In each instance the opposite kidney was normal or slightly more efficient than usual. These divided urine tests were made from two to four times in each instance before operation. The operative procedure consisted in a complete removal of the cicatricial capsule and a thorough mobilization of the renal pedicle, pelvis and upper ureter. Nephrolysis, or decapsulation, relieved all pain, and there was ultimately a complete return to normal function on the affected side.—*Jour. Am. Med. Ass.*, Oct. 10, 1925.

XUM

Case Reports

FOREIGN OBJECT IN BRONCHUS SIMULATING PULMONARY TUBERCULOSIS

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Montreal

The following case presents some points of general interest:

A. C., a girl of fourteen, had for the last four years exhibited symptoms of pulmonary trouble, beginning with pneumonia, followed one year later by a sharp hæmorrhage by the mouth. Within the last three years she had had from time to time prolonged attacks of coughing, with a moderate amount of hæmoptysis, which on two occasions had been fairly large hæmorrhages. She had been kept in bed for long periods and given careful feeding and codliver oil; between attacks she had seemed very well and had put on flesh. The most recent illness, however, had lasted for some months and she was not showing any signs of improvement. The family and personal history presented nothing of special interest.

When I saw her first, this year, she was noticeably pale, but was well nourished and looked comfortable: the pulse was 100, the temperature (afternoon) 102.0, the respirations 28. Examination of the chest showed good and equal expansion of the lungs, but there was an impaired note at the right base, with diminished breath sounds and prolonged expiratory phase. There were sharp dry rales at both apices, especially the right, and coarse crepitations at the bases. The sputum was plentiful and full of bright frothy blood. It was examined on two separate occasions, but no tubercle bacilli were found. The physical examination otherwise showed nothing of importance.

It was some time before an x-ray examination could be made of the chest, but this was finally done for me by Dr. Ritchie, of the Montreal General Hospital, and then the fact was revealed that there was a pin lodged in the left lower bronchus. Besides this, there were definite fibrotic changes at the roots of the lungs, and these were marked on the right side. It was suggested by Dr. Ritchie, however, that possibly the pin had first lodged in the right bronchus, and after having been there long enough to induce the changes seen, had been coughed up as far as the tracheal bifurcation and had then fallen over into the left bronchus.

The pin was extracted by Dr. George Hodge, of the Nose and Throat Clinic, by means of the bronchoscope, and the child made an uninterrupted recovery. When seen four months later she was perfectly well and all symptoms had disappeared. The signs in the lungs had cleared up completely, except for a slight impairment of the breath sounds at the bases.

In the presence of such signs as cough, hæmoptysis and fever, it is well to suspect tuberculosis and be guided accordingly, but it is better still to exhaust the possibilities of other conditions. Such a case is a fresh illustration of the value of an x-ray examination, though it must be admitted that it was done in this instance with no very great expectations, as the presence of a tuberculous condition seemed to admit of little doubt. The point which should have received more consideration was the fact of her having had so definitely what has been called "symptomless intervals." The history gave no other hint, for it was only after the discovery of the pin that the mother recalled (under persistent questioning) that on one occasion the child had been given a pin to hold, and that this had unaccountably disappeared. The child showed no symptoms at the time and nothing more was thought of the incident.

The literature abounds in descriptions of foreign objects in the bronchi, but in most instances it was known beforehand that they were there. This particular case is one of a steadily growing number in which the presence of a foreign object has not been suspected, for the symptoms give no special indications and the length of time during which they may remain in the lung may extend into many years. Jackson[1] reports one case in which a glass collar button was removed from the lung after a sojourn of twenty-six years, the patient recovering from a nearly moribund condition to regain perfect health; and in referring to a case in which a scarf pin had been in the lung for thirty-six years, Professor Thomas McCrae[2] makes the following comments:

"So long as we regard a foreign body in the trachea or in a bronchus as a curiosity which is not likely to come under personal observation, the diagnosis is not likely to be made. The history is most important, if there is anything in it to suggest the possibility of a foreign object, but no weight should be given to a negative history. It is pathetic to find how often the patient suggested the possibility of something having gained entrance to the respiratory tract, only to have ridicule cast on the idea or to be told that it was impossible. Children have insisted that they have "swallowed" an object, only to be laughed at..... It is a common happening to choke when eating or drinking, and nothing much is thought of it."

With regard to the treatment it is safe to say that the recent developments in bronchoscopy have made possible the removal of anything that has gained entrance to the air passages by the mouth, although the difficulty in doing so will

vary with the size and nature of the object, and the length of time it has been *in situ*.

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MULTIPLE LARYNGEAL PAPILLOMATA (SUB-GLOTTIC) IN A CHILD

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Montreal

A girl of nine was admitted to the Montreal Children's Hospital in March of this year, complaining of difficulty in breathing. This condition had been present evidently since she was two years old, when she had had a severe attack of broncho-pneumonia. At that time she was a "mouth-breather" and snored at night. Six months after her recovery from the broncho-pneumonia the tonsils and adenoids had been removed, and this caused some improvement in the symptoms of mouth-breathing and snoring: but a difficulty in breathing still persisted. Apart from this illness there was nothing important in her past history, and the family history was negative.

Examination showed that a considerable portion of the faucial tonsils still remained, with a small post-nasal growth. Indirect laryngoscopy was not practicable owing to the restlessness of the patient. The ears, nose and throat otherwise appeared normal. The parents were advised to bring the child into hospital for observation, but delayed doing so until about three months later, when they brought her in with the statement that the difficulty in breathing had become very marked, and had caused them much concern, so much so that they had been keeping her in bed. It was also stated that the child had not been cyanotic on any occasion, and her voice had at no time been affected.

On admission, the patient in bed assumed, by preference, a semi-recumbent position, as the stridor and dyspnœa became more evident when she was fully recumbent. Beyond this, posture had no appreciable influence on the dyspnœa, which was accompanied by some cyanosis, and at intervals became very marked. Examination by the medical service showed "no cause for this stridor and dyspnœa: the breath sounds were faint throughout; the voice sounds were very distant." X-ray of the chest, cervical and dorsal vertebræ and œsophagus, after the administration of a bismuth paste, was negative. The ears, nose and throat showed nothing more than had been noted at the first examination. The Wassermann reaction of the blood was negative.

The voice itself was in no way affected, but before speaking, the inspired air was obtained with great difficulty. There was marked stridor and retraction of the anterior chest wall. On several occasions the patient became cyanotic, and the stridor and dyspnœa assumed alarming proportions. A bronchoscopic examination was considered advisable, and in view of the patient's age and temperament it was decided to do this under a light ether anæsthetic, and, if necessary, perform a tracheotomy.

The old difficulty of a dyspnœic patient reacting badly under anæsthesia as soon as control of the accessory muscles of respiration is lost, was encountered, and soon after the anæsthetic by the open method was begun, the breathing became very shallow and the patient very cyanotic. As it was felt that some obstruction existed below the larynx, an emergency tracheotomy *via* the ligamentum conicum did not appear desirable, or as likely to have much effect, and although the patient's condition was alarming, a tracheotomy was performed midway between the manubrium sterni and the thyroid isthmus, tracheal rings being resected and a Number 4 tube inserted. The patient was then returned to the ward and following the tracheotomy experienced great comfort. Her mother said that her general condition seemed better than at any time during the previous seven years. A week later direct laryngoscopy was carried out under ether administered by insufflation through the tracheotomy opening. It was not considered advisable to administer sufficient anaesthetic to entirely relax the laryngeal musculature, and the larynx was, therefore, viewed with the true cords about midway between the cadaveric position and complete adduction. In this examination (with a Haslinger instrument), the larynx appeared normal and the true cords showed no involvement by any pathological process. During a momentary abduction of the cords, a sub-glottic growth was observed posteriorly. A bronchoscopic tube was now substituted, and with the aid of this the lowest part of the sub-glottic larynx and the upper part of the trachea were seen to be completely blocked with

multiple growths arranged in grape-like clusters and presenting the appearance of papillomata.

Eight of these growths were removed with a biting-spoon forceps; several had to be taken away before any air appeared to enter the lungs through the glottis. The specimens were examined by the pathological department, and the diagnosis of laryngeal papillomata was confirmed.

Following the operation there was great improvement in the general health of the patient. She no longer had any difficulty in breathing and there was no retraction of the chest wall. The tracheotomy tube was left in position. At the present time, four months after her discharge from hospital the tube is still worn, but is changed periodically for one of a different type and of a shorter or longer variety, in order to avoid, as far as possible, the unpleasant development of a perichondritis. She has no discomfort of any kind, and indirect examination of the larynx, which it is now possible to conduct after the use of a weak cocaine solution, is negative. It is my intention to examine at a later date the sub-glottic region and upper end of the trachea, and if there is no recurrence of the papillomatous masses, the tracheotomy opening will be allowed to close.

Pathology. Practically all varieties of benign tumours may occur in the larynx, and whilst rare, papillomata and fibromata are amongst those most frequently reported. They are met with more frequently in males than in females, and their etiology is a matter of conjecture. Clinically, the distinction between these types is as difficult to make as is the histological differentiation between papillary hypertrophy of epithelial origin, and papillomata of connective tissue origin. The former are seen, generally in adult subjects, in the region of the posterior commissure, the result of long-standing inflammation: the latter are observed more often in very young patients, usually in the region of the true cords near the anterior commissure. They may, however, spring from the mucous membrane of any part of the trachea, larynx or epiglottis and whether with a broad or a pedunculated base of attachment, they appear similar microscopically, showing an epithelial covering of either columnar or stratified cells, under which appears a dense connective tissue core showing no invasion, and constituting a supporting structure for their numerous arteries and veins. It is the most vascular varieties which usually show the characteristics of laryngeal papillomata, which recur after removal and which transplant themselves to the neighbouring mucous membrane; while their less congested brethren seem more often to disappear spontaneously, as do warts on the skin.

Statistics. A review of the records of the Montreal General Hospital, as far back as 1906, shows only four cases diagnosed as laryngeal papillomata None of these are recorded as the sub-glottic variety. The Mayo Clinic reported (1914-1920) twenty-six cases under twelve years of age. The Clinic of Moritz Schmit shows forty-six cases, adults and children, out of a total of 32,997 patients seen in ten years. In addition to this, 256 cases of fibroma are reported. Crowe and Breitstein[1], of Baltimore, have collected very interesting statistics showing that Rosenberg, 1896, Frankel's Clinic, Berlin, reported sixteen cases of papilloma of the larynx observed in a series of 5,808 children under thirteen years of age. Schrotter, of Vienna, found only ten cases among 7,320 children under ten years of age. Only twenty-three cases were seen in Chiari's Clinic in Vienna during the twenty years, 1892-1912. The Massachusetts General Hospital records the incidence of papilloma of the larynx as approximating one to 1,000 in children under fourteen years of age. The Manhattan Eye, Ear and Throat Hospital, during a period of fifteen years ending 1914, reported eight cases. The Johns Hopkins Hospital during the period 1912 to 1922, reported eleven cases.

In the cases reported there is almost invariably a history of the voice being affected, ranging from hoarseness to complete aphonia, indicating the extreme rarity of papilloma of the larynx below the cords only. In the eleven cases reported by Crowe and Breitstein[1] the voice was affected in every case except one, where hoarseness, although not mentioned in the symptomatology, had probably been omitted inadvertently, as the operative findings "showed large masses of a papilloma on both vocal cords."

Prognosis. Presenting usually a symptomatology of dyspnœa and hoarseness beginning with a cough or asthmatoid wheeze, these cases often have attached to them, over periods of years, such diagnoses as asthma, enlarged thymus, laryngismus stridulus, etc., and, judging from the reported cases of sudden death from asphyxia or during "a choking fit," some of which had no previous symptoms whatsoever, but which at autopsy showed the larynx filled with papillomatous growths, it seems reasonable to assume that many cases succumb to this affection which have not been investigated in sufficient detail to permit

a proper diagnosis being made. The diagnosis in such cases depends entirely on a carefully conducted laryngoscopic examination. In children it is very often necessary to resort to a direct examination without anæsthesia in any form, in preference to facing the attendant dangers of general anæsthesia in the presence of a papillomatous larynx.

It is believed that the comparatively large number of cases which remain undiagnosed until near the pathological limit, contributes very materially to the high mortality rate of this affection in children, a mortality rate, in unoperated cases, said to be even greater than in carcinoma of the larynx in adults, and one which would be greatly enhanced if the figures available could be supplemented by the number of deaths from papilloma of the larynx not recorded. It is also believed that it is chiefly these cases of the subglottic variety that die suddenly, without previous symptoms.

With proper operative treatment, the prognosis in these cases has rapidly become better and can now be considered as good. A preliminary tracheotomy, as a routine measure, conducted at a time when operative rapidity is not essential and when the best of technique can be employed contributes to a favourable issue in these cases perhaps more than their subsequent treatment.

REFERENCE

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RUPTURE OF THE BLADDER

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Montreal

The following case is considered worthy of note:

E. H., male, age thirty, was admitted to the Montreal General Hospital on May 3, 1925, with the complaint of severe generalized pain in the abdomen. He was brought in from the police station where he had been confined the previous night in an intoxicated condition. While in the cells this pain had developed and had gradually become very severe. He could give no reason for the pain, and knew of no injury received, but he had been intoxicated for several days. He had had no vomiting and no symptoms suggesting gastric or duodenal ulceration. His past history showed little of importance beyond the alcoholism.

Examination: Showed poor development and undernourishment. He lay with thighs flexed on the abdomen and was apparently in great distress. The abdomen was fairly full, in a condition of muscular spasm, uniform in contour and not moving with respiration. There was marked rigidity and tenderness generally, but no localizing point of tenderness. There was movable dullness in both flanks and some diminution of liver dullness. The bladder was catheterized and one ounce of turbid urine withdrawn. This was acid, with a specific gravity of 1022, a trace of albumin, and some pus cells: no sugar. There was a leucocytosis of 12,400.

A diagnosis was made of general peritonitis, due probably to a perforated gastric ulcer, and a laparotomy was performed, as follows: Under ether anæsthesia, a right rectus incision was made, above the umbilicus, the anterior sheath opened, the muscle displaced laterally and then the posterior sheath and peritoneum opened, with the escape of a great deal of turbid fluid, but no gas. The stomach and duodenum were explored and found to be normal. The gallbladder was adherent to the duodenum, but emptied easily and did not contain any calculi. Nothing was found in the upper abdomen to account for the fluid, and the incision was accordingly lengthened down to midway between the umbilicus and symphysis. The cæcum and appendix were found to be normal, but the omentum was found extending down into the pelvis, so this was used as a probable guide to the lesion, and it was found to be adherent to the bladder, which was then explored. A large rent was found in the posterior wall of this organ, at least two inches in length: the edges were ragged but there was nothing to suggest a tumour of the wall.

This rent was so extensive that it was deemed not safe to simply sew it up. The orifice was therefore drawn up to the anterior abdominal wall and the edge stitched to the peritoneum, thus making the opening experitoneal. The edges were then sewn to the anterior sheath of the rectus, and the abdominal cavity thus closed, after about two litres of urine had been withdrawn by suction. The incision was then closed, after a tube had been inserted into the bladder for drainage.

Nine days later the tube was withdrawn from the bladder and in another week the patient began to void. He was discharged cured in another six weeks.

FOREIGN BODY IN BRONCHUS

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Miss A. had her tonsils removed two months ago. A month later she complained of "wheezing in her chest." Musical rales were heard over the chest front and back. The rales were clearer and of higher pitch over the middle of the chest, a short distance to the right of the sternum. The patient incidentally mentioned the fact that a week after her operation, she missed the gold cap that had been on the right lower third molar, but thought that it could have no connection with the present condition. The x-ray plates showed a foreign body about 1 cm. in diameter, a short distance to the right of the sternum opposite the third rib. Evidently the gold cap has become lodged in the right bronchus.

XUM

Coughing with the head lowered has been ineffectual. The use of the bronchoscope has been advised but the patient objects because her symptoms are not distressing—only a slight wheezing and an occasional cough.

—*Bulletin Harvey Club of London, Ont.*

PROSTATIC HYPERTROPHY

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London, Ont.

A man, aged sixty-six, who for ten years had noticed frequency and increased difficulty in voiding, complained of abdominal distress, constipation and gave a history of one rectal hæmorrhage. He had been advised to have the hemorrhoids treated electrically. His rectal mucosa, on examination, seemed smooth, but the prostrate was definitely enlarged and the bladder extended almost to the umbilicus. A permanent catheter was tied in his urethra and the patient was encouraged to take fluids until he excreted 3,000 c.cs. daily. Because his general condition was good and his kidney function satisfactory, a primary suprapubic prostatectomy was performed one week later. The patient made an uneventful recovery. He was allowed out of bed on the fifth day and voided *per urethram* on the fourteenth day. The abdominal distress and feeling of fulness disappeared before the operation, when the bladder was kept empty. His bowel movements now are more regular and he has had no further rectal hæmorrhage. He voids freely and feels like a new man.

In prostatic surgery, it is essential to regard the patient as a whole instead of thinking merely of the local lesion, because the treatment depends entirely on the general condition of the case. If it is good, an immediate one stage prostatectomy may be advised. If there is evidence of infection or of back pressure, the bladder should be drained either by repeated catheterisation, or, better, by an indwelling catheter. Should he improve sufficiently, a one stage operation may then be performed. The two stage operation is reserved for patients who cannot be treated as above or who do not respond to the above treatment. In these, the bladder is drained suprapubically, and the prostatectomy itself is postponed indefinitely until the patient is in a safe condition.

Probably eighty-five per cent. of patients can be rendered safe for the one stage operation. The lowered operative mortality is due partly to an improvement in operative technique, but more to improved selection and preoperative preparation of patients, and to the increasing use of local anæsthesia.

—*Bulletin, Harvey Club of London, Ont.*

Among the letters of Pliny the younger the writer has run across two containing passages of considerable medical interest in themselves, and even more so by their associations and implications. The first in order is addressed to his friend, Romanus, and narrates the death of Verginius Rufus. In it he says—"He died at eighty-four years.... His health was robust, save for an habitual trembling of the hands, which, moreover, did not cause him any suffering. Only his dying was protracted and painful; but it gained for him new eulogies. To particularize, in his capacity of Consul, to return thanks to the Prince he prepared to speak. There was brought to him a book very heavy for an old man standing. The volume dropped. He bent to pick it up. His foot slipped on the polished pavement. He fell, and broke his thigh. It was badly set. Because of his great age, the bone would not unite." The other letter is addressed to Caninius. It is a graceful and glowing memorial of the decease of the poet Silius. It opens thus—"I have just learned that Silius Italicus has let himself die of starvation on his estate at Neapolis. A malady was the cause of his death. He had become the victim of an incurable abscess; his affliction from it was such that he went to meet his fate with unshaken constancy." In these cases described by the cultured Latin author, would our modern treatment have yielded more favourable results? We cannot be sure. A competent surgeon of to-day undoubtedly would have artistically adjusted and fixed the fractured femur, and scientifically manipulated and managed the abscess. Yet a broken thigh at eighty-four, and persistently obstinate suppuration at seventy-five are as much matters of solicitude in the opening years of the twentieth century as at the close of the first.—W. B. Konkle, *Am. Medicine*, August, 1925.

Editorial

THE WORK OF THE HEALTH ORGANIZATION OF THE LEAGUE OF NATIONS

THE Health Organization of the League of Nations has been effecting much good work. The advisory committee on the traffic in opium and other dangerous drugs, held its seventh session during the last week of August. The American Consul at Geneva attended the meeting in an unofficial capacity. The Chinese representative sent notice to the Chairman that he would not be present. The annual reports of the different governments to this Organization indicated the repressive measures which had been already adopted in regard to the traffic. Information was at the same time presented showing the extent of the traffic, and the immense financial resources behind it. The British representative gave detailed information regarding the traffic in opium in the Persian gulf; drawing attention to the extensive illicit trade which went on at this place in the direction of the far East. The Council was requested to write the Persian government to put into force without delay a more effective system of control. The committee also dealt with the consumption of opium in mandated countries, and examined a memorandum from the International Anti-opium Association on the increasing cultivation of the poppy in China. Notice was taken of the treaty recently concluded between the United States and Canada for the extradition of offenders against laws which had to do with the sale of opium and other dangerous narcotic drugs, and it was recommended that the attention of other governments should be drawn to the advisability of concluding similar agreements.

From enquiries undertaken by the Cancer Commission of the League the supposition that there is considerable difference between England, Italy and the Netherlands as regards the mortality from cancer of the breast and of the uterus is confirmed. Investigations of the factors which occasion this difference are now in progress and are likely to lead to interesting conclusions. With regard to the malaria commission, the results obtained during the recent tour of investigation have led the majority of the members to conclude that valuable as is the quinine treatment, the most effective weapon against this disease consists in improved methods for the destruction of larvae and mosquitoes. At the same time investigations are underway to obtain, if possible, a less expensive alkaloid which may prove a substitute for quinine in the treatment of this disease.

The exchange visits of public health officials to different countries have been continued. The exchange of officers trained in special departments of service has also been arranged. As it is difficult for officials in the British Dominions to take part in these exchange journeys, medical experts from Australia, New Zealand and from Canada have been charged with individual missions of investigation in Europe. The Canadian delegate made a thorough investigation of the methods in use in different European countries for combating tuberculosis. The delegates from the different countries all spoke in warm approval of the work which this health organization was carrying on. It is evident that these efforts for the international control of disease will, in time, result in an era of greatly improved general health. The international maintenance of public health must be regarded as an important factor in the promotion of international stability and will, we hope, have a great influence on the development of international amity.

THE PROBLEM OF THE POSSIBLE INDUCTION OF IMMUNITY IN CANCER

FOR years in various quarters it has been stated that occasionally human carcinoma or sarcoma disappears either spontaneously after incomplete removal, or following some profound alteration in the metabolic processes of the organism. This statement has been carefully investigated by Dr. Francis Carter Wood of the Institute of Cancer Research in Columbia University, (*Jour. Am. Med. Assoc.*, vol. lxxxv, p. 1,037), who writes that if these recessions have occurred, the phenomenon must be extraordinarily infrequent, so infrequent that conclusions as to the underlying causes can scarcely be drawn. According to his experience, tumours resembling sarcomata but difficult to differentiate microscopically from the granulomata are the type most likely to regress. The fact that some of these reported regressions were co-incident with an infection by certain bacterial organisms, especially those of erysipelas, led to the attempt to cure cancer by the inoculation of erysipelas germs, but owing to the number of deaths which followed this method, it has long since been abandoned. Attempts were then made to induce immunity against neoplasms by injecting serums from an animal previously treated with with neoplasm, or by the direct inoculation of the crushed tumour or of a tumour killed by Rœntgen ray. None of these methods proved effective, and the last two proved dangerous. Cases occurred of the massive production of tumour tissue in the unfortunate patient.

For a long time after the introduction of the Rœntgen ray and radium emanations, effects were produced on malignant structures that led observers to consider that these effects were the direct action of the rays themselves. Many of the destructive effects which followed the employment of these rays are now regarded as the result of alteration in arterial supply arising from a connective tissue sclerosis which greatly limited the supply of nutrition to the cancer cells.

Some investigators while admitting that without exceedingly large doses of radiation, cancer cells are merely deadened or damaged, claim that the final death of the cell is completed by some sort of activity on the part of the surrounding tissues; and the hypothesis was started that the body had some destructive capacity which aided the direct action of the radiation and destroyed such cells as had not been killed by the Rœntgen ray or the radium. Murphy, in the Rockefeller Institute, found that irradiating animals caused a general and local lymphocytosis, and that after such a lymphocytosis an increased resistance to tumour implantation could be demonstrated.

This assertion has been also carefully investigated at the Institute of Cancer Research, and it has been shown that lymphocytosis is in no way correlated with cancer immunity. Dr. Wood sums up the result of the investigations that have been going on for many years on the possible capacity of the body to produce immunizing substances against a growing cancer with the statement that, as yet, none of the results obtained warrant such an assumption. The clinical cures apparently produced by radium and Rœntgen ray in which viable cells still remain in the tissues, do not necessarily require the assumption of an immunity or of a destructive action of the connective tissues, but can be explained as easily by the assumption that the dense scar tissue immobilizes the cancer cells, and the greatly diminished blood supply prevents their rapid growth. The permanent cure of a cancer implies the destruction of all the cells of the growth. It must be affirmed that, so far as can be ascertained, the body offers no assistance to the therapy. Cures obtained in situations in which it is impossible that the cancer cells should all be destroyed must have a mechanical explanation and not one based on the

assumption of an immunity reaction. The production of a permanent cure by radiation implies that the destruction of the tumour cells must be as complete as must be their removal by effective surgery.

THE NECESSITY OF STANDARDIZATION IN COMMERCIAL THYROID PREPARATIONS

DR. REID HUNT, of the Harvard Medical School, in a recent paper (*Archives of Internal Medicine*, June, 1925, xxxv, 671), has recently pointed out the great inequality in strength of the various preparations of the thyroid gland. Dosage expressed in terms of grains of fresh glands does not give us accurate information as to the potency of the preparation. Thyroxin, the chemically definite compound isolated by Kendall, presumably represents the essentially active principle in the gland. According to Dr. Hunt, there does not seem to be a constant relation between the amount of thyroxin that can be isolated from a gland and its physiological activity; so the amount of thyroxin obtainable is not a reliable standard of activity. The iodine content has been made the basis for pharmacological evaluation by some producers, but according to Hunt doubts have been expressed as to whether the iodine content of the gland was really a reliable measure of its physiological activity. The belief that the thyroid gland contained physiologically inactive iodine in variable amount was strengthened by the fact that only a fraction of its iodine content could be secured in combination as thyroxin. The ideal standardization of thyroid products, therefore, would appear to be only attained through tests of their comparative potency on basal metabolism. The limitations of such an undertaking on a large scale are obvious. It is satisfactory, therefore, to know that the latest studies indicate that there is a close parallelism between the physiological activity of thyroid preparations and their iodine content. So long as the laboratory worker can measure the potency of a preparation with considerable accuracy by estimation of the iodine content, physicians should demand in all thyroid preparations this index as a guide in therapy. According to Dr. Hunt, some thyroid preparations have five times as much iodine as others, and there is the possibility of some tablets having very many times the physiological activity of others. Adulterations with non-thyroid iodine are readily detectable by an expert. Very few of the thyroid preparations on the market comply with the standard of the United States Pharmacopœia. Careful tests show that thyroid preparations vary greatly in physiological and therapeutic activity. To obtain satisfactory results physicians, when prescribing thyroid gland, should assure themselves that the tablets they prescribe contain a definite amount of dried thyroid gland. Only by this means will thyroid therapy be placed on a rationa basis.

THE VALUE OF IRON IN ANÆMIA

A CAREFUL experimental study has been carried out recently by Drs. Williamson and Ets, of the Department of Medicine in the University of Illinois (*Archives of Internal Medicine*, September 15, 1925, Vol. xxxvi, p. 333), and its results apparently show that inorganic iron appears to have very little value in anæmia, especially in anæmia arising from loss of blood. The question of the absorption and utilization of iron in the formation of hæmoglobin has for long engrossed the attention of clinicians and physiologists. The modern study of this

subject begins with Bungé. He found that animals became highly anæmic on rice and milk, and that others receiving preparations of inorganic iron along with this diet contained no more hæmoglobin than the controls. Abderhalden, later, in an extensive series of researches, came to the conclusion that animals on an iron-poor diet even when given inorganic iron failed to produce as much hæmoglobin as animals on a diet rich in food iron. Nevertheless, his observations led him to the view that medicinal iron (inorganic) in some way stimulated the formation of hæmoglobin from the food iron. Tartakowsky, however, came to the conclusion that medicinal inorganic iron is both absorbed and utilized in hæmoglobin formation. Since our later knowledge regarding vitamines, it would appear that in these experiments many of the results obtained were due more to deficiency disease than to a lack of iron only. Quite recently, Whipple and his associates studied the question anew, but along somewhat different lines, and showed that the diet of animals was of the very greatest importance. Their experiments gave no support to the value of inorganic iron in simple anæmia. Gibson and Howard while admitting the superiority of a diet rich in food iron say: "We still feel justified in continuing the administration of iron in the form of Blaud's pills."

In view of these discordant results, Williamson and Ets have undertaken a fresh investigation of this problem, giving special attention to the following points: The selection of those animals for experimentation which can be obtained in large litters, and the individuals of which are practically identical; the use of these animals in sufficient numbers to eliminate varying results; the use of a standard basal diet adequate in all respects; the prolonging of the experiments over a time sufficiently long to ensure decisive results, and lastly the estimation of the hæmoglobin content in the blood to be made by some method which will insure the highest possible degree of accuracy. To comply with the first point they used several hundred rats and thirty-two dogs. The iron free diet was obtained by leaving out the ferrous lactate from the salt mixture in the diet. They acknowledge this, however, to be in reality only an iron-poor diet. The experiments were continued over several months, in some cases as long as eight months, and the spectro-photometric method of determining the hæmoglobin was employed as being the most accurate. Their method of attacking the problem was as follows: Medicinal inorganic iron was administered orally to one group of rats and suitable controls kept. In another group the iron was administered subcutaneously, and the amount of hæmoglobin formed in the blood of both groups was compared after a period of several months with the amount of hæmoglobin in the blood and tissues of the controls. These experiments were repeated in rats rendered anæmic by single or multiple bleedings. Medicinal iron was also administered to pregnant rats during the period of gestation, and lactation. In this experiment sixteen newborn rats twelve days old, from dams on an iron free diet, were compared with nine of the same age from dams on a diet containing inorganic iron, and the hæmoglobin content of both groups was found practically the same; no effect on the offspring was noted.

The results obtained in the foregoing experiment were controlled by similar experiments on dogs. The following conclusions were arrived at: Inorganic iron, whether given by the mouth, subcutaneously, or intravenously, is absorbed and may be found principally in the liver and spleen, but is not converted into hæmoglobin, even when there was an urgent need of hæmoglobin in the circulating blood. Animals made anæmic by one or several large bleedings do not recover any more rapidly when inorganic iron is given in any of the above ways than did the controls. The efficiency of food iron is very pronounced and animals on a diet containing food iron recover rapidly from hæmorrhages that remove an amount of iron greater than exists in the entire body outside the blood. In the light of the foregoing experiments, it would appear that the administration of inorganic iron has no therapeutic value in anæmia.

DESIRABILITY OF AN EARLY DIAGNOSIS IN THE TREATMENT OF CRETINISM

IN a paper read at the last meeting of the American Pædiatric Society, by Dr. Kerley, of New York, on "Cretinism" (*Amer. Jour. Dis. of Child.*, September, 1925, xxx, 443), the histories of eight cases of cretinism followed in some cases from the age of a few months, in others from the age of three and five years till they reached the age of twenty-five, were reported. It was very notable how rapid were the physical changes which took place after thyroid therapy, but unfortunately this physical improvement was not associated with normal mental development. Under regular and persistent administration of thyroid gland for many years, it would appear that in some cases, (fifty per cent. of those reported), sufficient new gland tissue in the patient may be developed, and thyroid secretion so far re-established that the feeding of the gland may be greatly reduced or altogether discontinued. The dosage must be regulated in each case by its effects. Irritability, sleeplessness, enuresis and sometimes a tendency to epistaxis, were to be regarded as indications for reducing the dose. A lethargic state physically and mentally called for an increase.

In the discussion which followed, Dr. Koplik stated that he thought it was evident that thyroid therapy had not realized the expectations that were at first held out. The first paper on this subject published by Osler, reporting the wonderful improvement following the administration of thyroid to cretins raised hopes which have been seldom altogether realized. In all cases the administration of thyroid must be continued persistently. At the same time it must be realized that some disfunction exists which we do not yet understand; disfunction probably of other glands, which we are unable to treat on account of our imperfect knowledge. He emphasized the importance of the standardization of the thyroid preparations we prescribe.

Dr. Talbot called attention to the very notable failure in intellectual development in the majority of these cases even when physical development seemed almost complete. He considered that this was due to the fact that cretinism was rarely diagnosed before the age of eight months; in many cases it is not made until after the child is a year old. The importance of this will be recognized if we consider the very rapid development of the brain that takes place during the first five or six months of life.

It would appear that some secretion plays a fundamental part in this very rapid growth. If that secretion is lacking, defective development ensues and apparently can never afterwards be righted. It is important, therefore, to emphasize this fact and instruct the public, both medical and non-medical, on the necessity for an early diagnosis of the condition. By the help of basal metabolism it is possible to make a diagnosis when the baby is only three months old. The clinical signs, which are of assistance to us in our clinic is a peculiar lemon-yellow tint under the skin of the cheek, noticeable in these children, a thick tongue, coarse hair, and a peculiar hoarse voice. Dr. Talbot expressed himself as in the hope that if thyroid treatment was started in the first months of life, it might be possible to obtain a fairly normal mentality in these children. Dr. Smith called attention to the danger of over-dosing very young children. One child that he had seen at the age of two weeks was given a grain of thyroid and died in two days. Dr. Smith advises starting in the new-born with a dose of no more than one-tenth of a grain. Dr. Kerley, in conclusion, again emphasized the point that the dosage of thyroid must be determined for each case.

XUM

CLINICAL USE OF THE PARATHYROID HORMONE

AS an active extract of the parathyroid glands of oxen will shortly be available to the profession, it is well that a word of warning in regard to its indiscriminate use should be uttered. As only limited experimental clinical data are available it is impossible to state as yet what are the exact uses and limitations of this new hormone.

That it is the essential internal secretion of the parathyroid glands as is insulin the essential internal secretion of the pancreas would seem to have been amply proven. The four salient facts which laboratory study has established in regard to the active parathyroid extract are: (1) That it affords complete replacement therapy when injected into parathyroidectomized dogs; (2) that it causes a mobilization of calcium in the blood; (3) that overdosage (in dogs) produces a typical train of symptoms ending in death; (4) that physiological standardization of the potency of active extracts can be accomplished by determining the blood serum calcium mobilizing effect of single injections into dogs.

The response of animals of different species to injections of the hormone varies enormously; thus, the dog is highly sensitive to this internal secretion, while the rabbit is relatively immune.

A unit of potency has been defined as 1/100th of the amount of active extract which will produce an average increase of five milligrams in the blood serum calcium of dogs weighing twenty kilos. It has been found that fifteen units per day given by the subcutaneous route is adequate to keep a totally parathyroidectomized dog in normal health. It is probable, therefore, that this amount of the hormone is a fair approximation to the daily production of the intact glands in the normal dog and should be a useful guide in determining dosage for the human subject. Small doses repeated at frequent intervals (a few hours) are cumulative in action and will eventually raise the blood calcium to dangerous levels. As no satisfactory antidote has as yet been found which will relieve the symptoms resulting from overdosage with the hormone, it cannot be too strongly emphasized that overdosage must be absolutely avoided. In clinical practice, therefore, treatment with the hormone should be controlled by blood serum calcium determinations until definite information is available as to adequate dosage and tolerance limits. From the clinical data at present available, it would appear that small doses (ten to twenty-five units) repeated daily or on alternate days may be given with safety. If untoward symptoms such as nausea and vomiting should occur, the extract should be withdrawn.

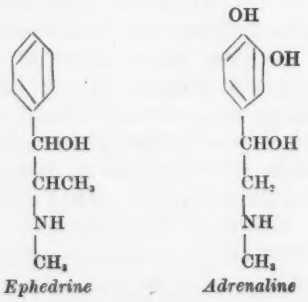
It has been shown that overdosage phenomena deliberately produced in dogs are favourably influenced by intravenous saline or glucose but this treatment, though helpful, has by no means the virtues of an antidote.

J. B. COLLIP

EPHEDRINE—A NEW (?) SYMPATHOMIMETIC DRUG

FOR more than 5,000 years the Chinese have employed a vegetable drug, known to them as Ma Huang, as a diaphoretic, circulatory stimulant, antipyretic, cough sedative, etc. It was examined chemically in 1888 and an alkaloid isolated; further study indicated its formula to be represented thus:

If this is compared with adrenaline, a striking chemical similarity is apparent.



Ephedrine *Adrenaline*

Recent laboratory studies[1,2], of ephedrine have shown it to be strikingly similar to adrenaline in a pharmacological way, so similar in fact, that it must be regarded as a sympathomimetic drug. Thus it increases the rate and force of the heart, effects which are not prevented by atropine or vagotomy, and it constricts the splanchnic arterioles, raising the blood pressure considerably. These actions persist after nicotine poisoning; hence the point of attack of ephedrine is probably the sympathetic endings. The action on the salivary glands and the pupil is also the same as that of adrenaline.

In experimental shock (due to histamine, peptone, hæmorrhage and the handling of abdominal viscera) ephedrine produces a decided increase in blood pressure, but only in histamine and peptone shock is the action enduring; in the other instances the circulatory improvement is incomplete and transitory.

The blood pressure effect of ephedrine differs from that of adrenaline in being decidedly more prolonged. The rise persists for at least fifteen minutes and sometimes lasts indefinitely.

Very recently[3] eighty-four clinical experiments have been carried on with the alkaloid. The blood pressure rise varied from 0 to 65 mm. Temporary improvement was caused in two cases of Addison's disease; paroxysmal attacks of certain cases of asthma were relieved; urticarial lesions in serum disease disappeared; improvement occurred in a case of circulatory collapse and when locally applied to the nasal mucous membrane it caused prompt contraction which persisted for more than three hours and exerted no local irritant effect.

One of the most noteworthy points concerning ephedrine is the fact that its action may be elicited by oral administration. The dose for humans (oral or subcutaneous) is relatively large (50 to 150 milligrams); unfavourable results in the eighty-four cases noted were inconsequential—nausea in two nervous patients and a transient pulsus alterans for about an hour in a case of marked myocardial degeneration.

R. L. STEHLE

In connection with the above description of ephedrine sulphate by Professor Stehle, we note an interesting paper by Drs. George Fetterolf and Marshall B. Sponsler*, of Philadelphia, on the action of this drug when applied in solution on the nasal mucous membrane. For purpose of investigation seventeen patients were selected from the medical wards of the University of Pennsylvania Hospital, all of whom presented turgescence of the nasal mucosa, but none of whom had nasal discharge, atrophy or any other condition which might complicate the results to be observed. With a cotton brush the drug in a five per cent solution each patient was lightly painted over an area of about 1 cm. in diameter, on the anterior part of the lower turbinate of one side of the nose only. Care was taken that the brush was not oversaturated so that none of the solution would spread over surrounding tissues. For the sake of comparison the opposite side was left untreated, and the results were observed frequently during the following ten minutes. In every case the turbinate mucous membrane began to shrink in from a few seconds to a minute after the application was made. The contraction proceeded with marked rapidity and the maximum was established in less than five minutes. In every case the turbinate became contracted throughout its entire length in spite of the fact that the drug was applied only to the anterior portion. The contraction became so complete that the mucosa instead of its usual rounded character was shrunken so that it had an irregular undulating contour lying flat on the bone. The colour of the mucosa was altered to a pale hue, but the extreme pallor following the local application of epinephrin never appeared. This contraction persisted for about two hours and a half; complete relaxation was established in a little over

(1) CHEN, K. K. AND SCHMIDT, C. F., *Jour. of Pharmacology and Experimental Therapeutics*, xxiv, 339, (1925). (2) CHEN, K. K., *ibid*, xxvi, 83, (1925). (3) MILLER, T. G., *Amer. Jour. of the Medical Sciences*, clxx, 157, (1925).

*Archives of Oto-laryngology, Vol. ii, Aug., 1925 p. 132.

three hours. There was no sign of any irritative after effects. There was no sneezing, and the only subjective sensation spoken of by the patients was the ability to breathe more freely through the nostril on the side to which it had been applied. This drug has the promise of much usefulness.

THE CONTROL OF RICKETS

UNDER date of August the twenty-ninth there appears in the *Journal Of The American Medical Association* a report by Dr. Martha Eliot, of New Haven, on the results of an attempt to prevent the development of rickets in a community by the intensive use of cod liver oil and sunlight. A definite section of the city was outlined with a population over 13,000, one-third of which were negroes, and two-thirds Italians, Poles, and Americans. All the infants born within that district were examined monthly; a skiagram of the wrists was taken and a general physical examination made by a careful physician.

At the beginning of the demonstration it was believed that from ten to twenty drops of pure cod liver oil, given twice a day, would be sufficient to prevent the development of this disease in young infants. Within a few months, however, it was found that many infants, although taking this amount more or less regularly, showed Rœntgen ray evidence of early rickets. Therefore, beginning with the first month of life, babies were given one-half teaspoonful of the pure oil twice daily; during the second month this amount was gradually increased to one teaspoonful twice daily, or even one and one-half. It was found that this amount of the oil was well tolerated, and could be successfully given in summer as well as in winter. The method of giving indoor sunbaths in winter and outdoor in summer is described; it might be difficult in rigorous climates, however, to ensure the coöperation of the average mother in such an apparently drastic measure.

Some of the results of the experiment and the observations of Dr. Eliot and her associates are most enlightening. Of the two hundred odd babies studied in this investigation, only eleven per cent. showed no rickets at any time by Rœntgen ray examination; eighty-three per cent. showed mild rickets by Rœntgen ray examination at eight months of age; in ninety per cent. of these, the manifestations were recognized by the Rœntgen ray before the sixth month. Eighty-six per cent. of the total number studied showed, on clinical examination, signs of rickets, but the clinical evidence appeared later than did the changes in the bone shown by the Rœntgen ray, the clinical diagnosis of the majority being made only at the age of eight months and over. An early clinical diagnosis of rickets is much more difficult to make with any degree of certainty than an early Rœntgen ray diagnosis, because the deformities due to rickets are only exaggerations of the normal shape of bones and cartilage, and it is difficult in many cases to be sure that these indefinite clinical signs are manifestations of developing rickets. The line of differentiation between palpable costochondral junctions in a normal baby and the slightly enlarged costochondral junctions of early rickets is often impossible to draw, and one is easily deceived regarding enlargement of the epiphyses at the wrist by the presence of either too much or too little fat. It is also difficult to say when prominence of the parietal bones should be attributed to rickets, or to an inherited prominent forehead.

Dr. Eliot states that in this investigation a clinical diagnosis of rickets was made when any two of the following well recognized early signs of rickets were definite: enlarged costochondral junctions, enlarged epiphyses at the wrist, enlarged cranial bosses, definite craniotabes or a Harrison's groove. A diagnosis was not made on one sign alone, except in the case of craniotabes, and in most of

these cases other signs were present. This statement regarding the diagnostic signs of the disease is open to the criticism that the signs above mentioned are only found clinically when the disease process is fairly advanced; and can scarcely be called "early."

Dr. Eliot draws several very interesting conclusions. Because of the practical universality of the disease in the group studied it would seem that under some conditions rickets cannot be entirely prevented in rapidly growing infants, and in such perhaps certain early Rœntgen ray signs of rickets must be considered normal. If any two groups of infants show the need of early antirachitic treatment more than others, they are the large, rapidly growing breast-fed infants and premature babies. Evidence of the well-known seasonal variation in rickets was recognized. Slight signs of rickets were found in young infants at all seasons of the year; moderate or marked rickets in the winter months.

Rickets, according to Dr. Eliot's observations, is an extraordinarily chronic disease. Rickets and the repair of the rachitic process go on hand in hand for months and in some cases for years, neither progressing to an extreme state nor disappearing.

In discussing this paper Dr. Park, of Yale, stated that if we admit the possibility of mild rickets being physiological it would imply that the impetus of growth is greater than the power to calcify. However, before this can be accepted as true, it must be shown to be present in infants living in other places, and under different conditions, which has not yet been done. R. R. STRUTHERS

DIHYDROXYACETONE

SINCE the publication in this *Journal* of the observations on the metabolism of dihydroxyacetone in diabetes, numerous inquiries have been received from practitioners as to the availability and method of use of this product. It is, therefore, deemed desirable to publish the following statement as to the present status of our knowledge:

As a result of observations carried on in the Montreal General Hospital it would appear that dihydroxyacetone is more readily tolerated than glucose by the diabetic individual. This may be shown in different ways. Following its administration it is more readily oxidized. This is shown by respiratory quotient studies. It is also more readily stored. This is demonstrated by the fact that in many instances after its ingestion, the degree of hyperglycæmic response, as compared with that of glucose, may be only slight or there may be no hyperglycæmia at all, in spite of the fact that it is not excreted in the urine. Its oxidation, as in the case of glucose, aids the combustion of acetone bodies. It appears in certain instances to have some influence upon the metabolism of carbohydrate preexisting in the body. This is suggested by the fact that in certain instances the rate of excretion of glucose in the urine diminishes and the blood sugar falls. This latter phenomenon is not due to impairment in kidney function, at least so far as the presently available renal efficiency tests demonstrate.

When given in the form of a phosphate the above findings are still more marked. This phenomenon is of special interest in view of the metabolism of phosphorus, noted following the administration of insulin or calcium hexose phosphate to diabetics. In the majority of cases all the above observations may be noted when dihydroxyacetone is administered under certain conditions, such as when given alone in small quantities and when the patient is in the post absorptive state. When, however, it is given with other food materials various results are noted; though strikingly good in many instances, an equal number of indifferent results

and failures are met with. The use of this product in the treatment of diabetes is still in the experimental state.

For these reasons it is obvious that much more must be known of its metabolism before an attempt be made to employ it clinically except when the patient can be controlled as in hospitals with properly equipped laboratories.

I. M. RABINOWITCH

ON CASCARA

A VERY interesting investigation has been carried on by R. H. Clark and K. B. Gillie of the Department of Chemistry, University of British Columbia,* as to the possibility of the active principle of Cascara being present in the wood as well as in the bark of the tree *Rhamnus Purshiana*. The tree is found widely distributed on the western slope of the Cascade range of mountains in southern British Columbia, Washington, Oregon and northern California. The aborigines of the regions in which the tree is found are said to have used the bark for medicinal purposes, but its value as a purgative was only brought to the knowledge of the profession about the year 1877, in a paper by Dr. J. H. Bundy, of Colusa, Cal. Since that time its use has become world-wide and from one to two thousand tons of the bark are consumed annually by manufacturers of the various laxative preparations. Owing to this enormous demand the supply is becoming exhausted, and the price of the bark has more than quadrupled. The active principle has never been isolated, and in spite of investigations by many chemists, little is known regarding its true character.

In view of these facts, Messrs. Clark and Gillie determined on carrying out an investigation as to whether an extract from the wood possessed sufficient activity to make it a commercial source of the drug, and to examine the drug itself and find, if possible, some method of preventing the tendency to produce griping with which the extract from the fresh bark is credited, other than by storing the bark for a period of one to three years as directed by the United States and British Pharmacopœias. It was hoped in this investigation, also, to make some progress in ascertaining the chemical character of the active principle and to note whether the age and habitat of a tree in any way affected the quality of its active principle.

Their investigation has been rewarded by finding that the wood does contain a considerable amount of the cathartic principle; seventy-one per cent. of the amount found in the bark which is sufficient to make it, as well as the bark, a source of commercial value. As to the griping action of some of the extracts, it was found that this effect is far from common. It was only met with in the case of the extract of two trees which had been grown within the city limits and had had a rapid growth. Their investigations also indicate that the active principle is not a glucoside; or if it is, the non-carbohydrate portion is active, after it is split off from the parent substance.

**American Journal of Pharmacy*, June, 1924; *Vancouver Medical Association Bulletin*, Oct. 1, 1925.

Editorial Comments

ERRATA

By error there appeared in last month's *Journal*, at the head of Dr. Archibald's paper on Lipiodol Injection of the Tuberculous Lung, as part of the title to Dr. Archibald's paper, "Chief Surgeon of the Royal Victoria Hospital." We would point out that this was an error on the *Journal's* part. The title should have been "Professor of Surgery and Director of the Department at McGill University."

The first number of the *Post-graduate Medical Journal*, the official organ of the Fellowship of Medicine of Great Britain, has been received. Sir William Hale-White writes the foreword, in which he states that experience has shown that undergraduates and post-graduates cannot be satisfactorily taught together, and that it is extremely difficult for the several undergraduate schools of London to add post-graduate to undergraduate instruction. It is therefore with much pleasure that the Canadian profession will learn that he advises that a large medical school should be built in London which should contain beds for both medical and surgical patients, and ample accommodation for every specialty. The staff should consist of able men keeping themselves abreast of the times, who could teach and who would recognize that their first duty was to the post-graduates. Sir William Hale-White appears to dread what he terms the enormous cost of such a scheme. Such schemes have been carried out in the States, and our profession in Canada will look forward with hope to the establishment of such a hospital in London. In the meantime this *Journal* has been founded to give an account to its subscribers of the post-graduate work that is being done in Great Britain. In the present number we observe a very interesting post-graduate lecture by Sir Humphrey Rolleston on "The Medical Aspects of Gall Stones." Another very timely address by Thomas Watts Eden, consulting obstetric physician to Charing Cross Hospital, on "The Prevention of Puerperal Sepsis." Canadians wish every success to post-graduate teaching both in London and Edinburgh.

Correspondence

RESIGNATION OF SIR HENRY GRAY

We are requested to publish the following letters:

Royal Victoria Hospital,
Montreal, September 25, 1925.

Sir Henry Gray, K.B.E., Surgeon-in-Chief,
Royal Victoria Hospital, Montreal.

Dear Sir Henry:

Sir Arthur Currie has sent the Hospital copy of his letter to you of the 24th instant.

In view of that letter and under the circumstances, the Executive of the Hospital has reluctantly decided to ask you to be good enough to hand in your resignation as Surgeon-in Chief.

When you do so, the Executive is prepared to appoint you Consulting Surgeon of the Hospital.

Yours truly,
(Signed) H. E. Webster,
Secretary.

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622 Sherbrooke Street West,
Montreal, September 29, 1925.

H. E. Webster Esq.,
Secretary, Board of Governors,
Royal Victoria Hospital, Montreal.

Dear Sir:

In reply to your letter dated 25th instant, I formally accede to the request of the "Executive of the Hospital."

In view of all the circumstances of my connection with the Royal Victoria Hospital I prefer to sever my connection with it completely now.

I am sorry to trouble you further but should like to have the instruments, etc., which I provided for use in the Hospital returned or replaced.

Yours truly,
(Signed) Henry M. W. Gray.

In reference to the resignation of Sir Henry Gray the *British Medical Journal* of October 3rd, refers to him as a "Lecturer on Clinical Surgery in McGill University." We are informed that McGill University had no part in inviting Sir Henry Gray to come to Montreal, and that at no time did he occupy any position whatever on its staff. Such instruction as he gave was without academic position. We are also informed that the Medical Board of the Royal Victoria Hospital had no part either in Sir Henry Gray's appointment or in his resignation.

Abstracts from Current Literature

MEDICINE

Lowered Basal Metabolism, in Postinfectious Stages and in Diseases Characterized by Slow Pulse Rate — Preliminary Report. Schick, B. and Cohen, P., *Am. Jour. Dis. Child.*, September, 1925, Vol. 30, page 291.

Several diseases at certain periods in their course have a retarded pulse rate, notably tuberculous meningitis, hydrocephalus and intracranial hæmorrhage. The slow pulse has usually been assigned to irritation of the vagus. A slow pulse rate is also seen in the posteritical period of lobar pneumonia, and in those diseases characterized by icterus. The authors offer an explanation of this slow pulse in these diseases. They believe that there is a definite relationship between the pulse and the basal metabolism or oxygen requirements.

The tables of results on the patients studied shows that some had an undoubtedly low postinfectious basal metabolism, which usually rose to normal in about one week, but in three cases persisted for several weeks. The less toxic cases showed no lowered basal rate.

The authors' theory is that the lowered postinfectious metabolism is caused by more or less generalized cellular damage which at times hits the endocrine glands especially. Only the toxic cases had a low postinfectious metabolism. In cases of meningitis and other brain disturbances we have another factor, that of cerebral injury and temporarily diminished cerebral function with a resultant diminution of body activities, hence a low metabolism and slow pulse. It is believed that the slow pulse is dependent on the low metabolism and the decreased oxygen want of the tissues, due to tissue damage by disease.

R. R. Struthers

The Output of the Heart per Beat in Heart Disease. Rabinowitch, I. M., *Arch. of Int. Med.*, August, 1925.

The object of the author's article is to record the results that have been obtained in an effort to determine the values for the output of the heart per beat by a combined study of arterial and venous oxygen content and respiratory air analysis with the laboratory methods at present available. Rabinowitch begins by stating that the volume of blood passing through the body at any moment is numerically represented by the product of the pulse rate and the output per heart beat. Since the pulse rate is generally increased in cases of cardiac failure, it appears to him, reasonable to infer that the slowing of the circulation is due to a greater relative decrease in the output per beat. As regards the output of the heart per minute in man, a review of the articles by various workers shows it to vary between 3.8 and 6 litres.

The method of investigation used by the author consisted in simultaneous determinations of the oxygen content of arterial and venous blood, and the ratio of oxygen absorption in the lungs. He reminds us that various workers have found that the oxygen content of the blood taken from the arm may not necessarily be indicative of a similar content elsewhere in the body, i.e., the mixed blood entering the pulmonary artery. However, when taken under a uniform set of conditions in health, it appears to have a fairly constant composition. It is suggested that when a test is performed under a uniform set of conditions, the value of the found circulation rate bears the same relationship to the true circulation rate as the oxygen content of venous arm blood bears to the oxygen content of the mixed venous blood entering the lungs. That is, it is possible to obtain a relative measure of the circulation rate. The *relative measure* is the important finding as far as the clinical utility of a laboratory procedure is concerned. In the author's tests it was shown that by performing the work under a definite set of conditions, there was a correlation between the relative values of the circulation rate obtained and the clinical picture. The differences found between the values in normal individuals and those with heart failure were so marked and consistent as to suggest a definite significance.

The average relative ventricular output of blood per beat in ten normal persons at rest was found to be 85.3 cc. This differed strikingly from the results obtained with cases showing cardiac failure. Here the average output per

beat was 27.3 cc. The writer considers that the differences must still be somewhat greater than those obtained, as the normal subjects tested above were really not "normal" in the true sense of the word, as they were hospital patients.

It was also noted, while carrying out the various tests that there appeared to be some general agreement in the values for the vital capacity and the relative cardiac output, but it was felt that this must be accepted with reserve. as in the majority of instances the patients were bedridden and it was not possible to record the data in terms of litres per square metre of body surface. L. C. MONTGOMERY

The Medical Treatment of Pyloric Stenosis of Infants. Davison, W. C., *Johns Hopkins Hosp. Bull.*, Sept., 1925, xxxvii, 159.

It is pointed out that although surgical treatment of pyloric stenosis in infants is usually satisfactory, the mortality after operation is sufficiently high to render a trial of medical treatment advisable in many cases. The series under consideration consisted of thirty-two infants, with unmistakable stenosis of the pylorus, care being taken to exclude those with merely suggestive symptoms of the condition; the type of case, for example, which is spoken of as "pylorospasm." Three of the cases died, but they were moribund on admission and had been refused operation by the surgeons because of their hopeless condition. The author does not claim that medical treatment is the best proceeding in every case. Surgery has unquestionably saved lives which would have been lost if medical treatment had been persisted in. The problem is to decide on the type of case which has the better chance of recovery if operated on promptly, and how long medical treatment should be carried on in other cases before operation is advised.

In certain types of cases operation should be performed before medical treatment is attempted. First in order of urgency is the case with unmistakable signs of *complete* pyloric obstruction, with the starvation type of stools and a history of having vomited all food and water for several days. In such cases it has been shown that the tumour may be cartilaginous, projecting into the duodenum as the cervix uteri does in the vagina. Attention should be entirely directed towards preparing such a child for an early operation; blood transfusion and intravenous or intraperitoneal injections of normal saline will often bring about striking improvement in the general condition.

Another type of case in which early operation is advisable is the breast-fed infant whose mother cannot manage to nurse her child while it is in hospital. While medical treatment may sometimes be successful in these cases, the mother's milk supply may fail if she does not nurse regularly, and then prolonged hospitalization becomes hazardous.

The medical treatment given is as follows: the infant is fed every four hours with enough woman's milk to give at least 100 calories per kilogram of body-weight per day. If the feeding is vomited within two hours, an amount equal to that vomited is refed. If this is vomited, the stomach is washed out with water or one per cent. sodium bicarbonate solution, heated to 108-110° F., and as much milk as has been vomited is put into the stomach with the tube. Cow's milk and sugar may be used in place of woman's milk if the latter is unobtainable, but the substitution is a poor one. The feeding should be done slowly. It may be necessary to give the milk by tube. In some of the cases thick farina cooked with milk was found to be best. Drug therapy did not appear to be strikingly beneficial.

The great disadvantage of this type of treatment is the length of time required. The average length of the hospital course was fifty-three days with the medical treatment, whereas those who recovered from operation were discharged after an average stay of nineteen days. The advantage of the medical treatment lies in the reduction of the total mortality.

H. E. MACDERMOT

PÆDIATRICS

Acrodynia—A Clinical Study of Seventeen Cases. Rodda, F. C., *Am. Jour. Dis. Child.*, August, 1925, page 224, Vol. 30, No. 2.

Recent literature on this subject dates from a report of ten cases by Bilderback in 1919. Since then over one hundred cases have been reported on this continent. It was thought that this was a new disease. However, it was recognized in 1914 in Australia, and had been noted even thirty years before that date by Australian physicians under the name "raw-beef hands and

feet.'' From this Rodda concludes that we have had such a disease always, and that it does not bear, as was supposed, any relation to diet deficiencies or to the pandemic of influenza in 1918.

The clinical picture of the disease is strikingly similar in all cases. A normal child between the ages of one and three years abruptly shows extreme hyperirritability, loses appetite, sleeps badly, perspires excessively, and cries and whines constantly. Miliaria develops. After two to four weeks the fingers and toes become red, swollen and œdematous, present a maculopapular eruption, are cold, clammy and somewhat cyanosed, followed by desquamation. Emaciation follows, with muscular weakness or paresis. Photophobia, alopecia, salivation and ulceration of the gums, with even loss of teeth, may occur. The child presents the picture of abject misery.

As regards the etiology, Rodda believes there is much evidence in favour of its being a chronic intoxication from upper respiratory infections. Although there is no definite seasonal incidence the largest number of the seventeen cases reported by the author were seen in late spring or early summer, following the greatest incidence of grippal infections. Infected tonsils, persistent nasal discharge and cervical adenitis found in all cases is reasonable evidence of a possible focal infection. Rodda states that he has never seen the condition in a child whose tonsils and adenoids had been removed, and in his later cases, states that the prompt removal of the tonsils and adenoids was followed by prompt recovery.

He concludes that acrodynia (literally painful extremity) is a disease of infancy and early childhood, preceded or accompanied by an upper respiratory infection; that the disease is due probably to focal infection in the tonsils and adenoids, and that prompt removal of these foci may abort the disease, or be followed by speedy recovery. R. R. STRUTHERS

Rickets in Infants; Treatment with Irradiated Milk. Kramer, Benjamin, *Am. Jour. Dis. Child.*, August, 1925, page 195, Vol. 30.

Eight children suffering from active and severe rickets were treated by the author with a diet consisting of orange juice, cereal and milk, which had been irradiated with the mercury vapor quartz lamp in a large shallow dish for not more than two hours at a distance of two feet.

The clinical diagnosis of rickets was confirmed by roentgenograms and by analyses of the calcium and inorganic phosphorus of the serum. Following the administration of the irradiated milk the inorganic phosphorus of the serum reached the normal level in four weeks, and the x-ray showed definite healing in three weeks, which was complete in four weeks. Studies of calcium and phosphorus balance showed a marked increase in the retention of calcium and phosphorus during the period when the irradiated milk was fed.

The chemical changes in the blood were identical with those reported following the administration of cod liver oil to rachitic children or exposure directly to sunlight or the mercury vapor lamp. These results are very interesting in view of the inertness of ordinary cows' milk as a cure for rickets. R. R. STRUTHERS

SURGERY

Degeneration of Fibromyomata of the Uterus. Seed, Lindon, *Surg. Gyn. and Obst.*, Sept., 1925, p. 333.

The basis of this study was fifty-three fibroids showing degeneration. These formed 13 per cent. of a group of 404 specimens removed at operation. The author points out that fibromyomata are no more subject to degeneration than any other benign tumour, which is notable when one considers the large blood supply necessary for their nourishment, the varying degrees of pressure and the varying conditions of the child-bearing period and senility. Hyaline degeneration, the first reaction to insufficient blood supply, is present in all types of degeneration. Its distribution may be diffuse or localized in patchy areas throughout the tumour. In these areas there may be deposition of lime salts.

Œdematous and cystic degeneration was very common. The cysts contain either watery or gelatinous material, and often are of large size. The first stage in the cyst formation is œdema, noted in the gross by the watery appearance of the tumour. Besides the accumulation of fluid the cells themselves undergo destruction by karyolysis.

Red degeneration is so named from the red colour produced during necrobiosis: this form is

frequently associated with pregnancy. Clinically it presents symptoms of weakness, lassitude, dull ache and soreness, and may go on to mild fever, leucocytosis, and tenderness. The symptoms present depend on the size of the tumour and the acuteness of the process. Red degeneration can be definitely traced through the stages of brown, gray, and yellow degeneration, and finally calcification, the red colour persisting into the final stage. Microscopically, it is characterized by patchy or complete fatty necrosis with vessel thrombosis, extravasation of blood cells and deposition of blood pigment.

Sampson's experimental work tends to show that venous congestion is a factor in this type of degeneration. Calcification occurs in two forms: first, following red degeneration there is a deposit of calcium around the periphery; in the second type deposits of calcium are scattered throughout the tumour. In addition to degeneration, fibromyomata are liable to infection and suppuration. Degeneration produces little constitutional disturbance unless it is of the red type, when a low grade toxæmia may occur.

R. V. B. SHIER

Vesical Diverticula. Ogier, W. L., *Brit. Jour. Surg.*, July, 1925.

Diverticula of the bladder do not form a large proportion of vesical diseases. Of 924 operations on the bladder, performed at St. Peter's Hospital during the past ten years only twenty-seven were for diverticula. Their origin is uncertain. Some authorities claim that they are always congenital and that they most often occur at a developmentally weak point in the bladder wall, namely just above the ureteric orifices, or behind the interuretic bar. Another view is that they are formed from accessory ureteric buds. Their enlargement is certainly encouraged by obstruction to the urinary outflow. In domestic animals the condition is practically unknown. In women the condition is decidedly uncommon, no doubt because they are much less liable to urinary obstruction.

However, though they are usually a congenital condition, the author reports a case which was undoubtedly acquired, the result of urethral stricture. There were multiple diverticula in various parts of the bladder wall away from the usual areas of weak musculature.

Small diverticula do not give symptoms. The larger ones may, but as a rule infection and its sequelæ are the symptom-producing agencies. The infection leads to cystitis. Stagnation leads to stone formation, which may be preceded or followed by infection. Hæmaturia is frequent and may be due in the case of diverticula to infection. Hæmaturia is frequent and may be due in the case of diverticula to infection, stone, or associated new growth. Frequency of micturition, the result of inflammation, and difficulty of micturition, the result of obstruction, are of course common. There is usually pain when cystitis is present. Two other associated conditions sometimes occur, the first, hydronephrosis, due to compression of the ureter, and the second, constipation, due to rectal pressure.

The diagnosis is made by cystoscopy. The size of the pouch is best determined by a cystogram. X-ray pictures determine the number of calculi, if any are present.

The treatment is palliative and radical. The palliative measures are frequent washings of the bladder through a catheter, and encouraging the patient to find a position in which he can completely empty the bladder before irrigation is done. The radical treatment is excision, which may be difficult. The proximity of the ureter is the real danger. In addition to dealing with the diverticulum, it is most important to remove any existent obstruction to the urinary outflow.

R. V. B. SHIER

The Sequelæ of Gastro-Enterostomy. Balfour, Donald C., *Annals of Surgery*, Sept., 1925, p. 421.

The basis of this communication was a study of some 343 cases in which gastro-enterostomy had been a failure. The history and subsequent findings in 131, or 38 per cent. of these, made it plain that gastro-enterostomy had been unnecessary. In 212, or 63 per cent., it had been a necessary procedure. The only basis for gastro-enterostomy is a demonstrable lesion. There are two occasions when the surgeon may have great difficulty in deciding. First, those cases in which from history and x-ray examination the diagnosis is positive, but inspection of the stomach at operation reveals nothing abnormal. In this case the stomach or duodenum must be opened and inspected. The second confusing case is the one with marked pyloric hypertrophy. Moynihan points out that an ulcer crater practically never occurs in the pyloric ring.

XUM

In the 131 unnecessary gastro-enterostomies, the outstanding feature was the total absence of a history justifying an ulcer diagnosis, and also the findings at the second operation, as well as evidence of pathological conditions elsewhere in the abdomen. The predominating symptoms of these gastro-enterostomy cases are nausea and vomiting.

Failure of gastro-enterostomy in cases where the indications were definite were due to (1) imperfect functioning due to a defect in the anastomosis, or its location; (2) an overlooked intra-abdominal disease; (3) a recurring ulcer. The common cause of failure of function is imperfect drainage due to a poorly placed stoma, or to contraction due to disease, or it may have been made too small at the original operation. The proximal loop of jejunum may be too long and stasis of its contents results.

It must be remembered that in cases of gastric ulcer gastro-enterostomy must not be depended upon alone to cure the condition. Local treatment of the ulcer is necessary. In duodenal ulcers it is in the author's opinion the best procedure at our disposal. If, however, the duodenal ulcer is bleeding then cauterization or resection must be added to gastro-enterostomy.

The first and most important cause of failure is reactivation of the original ulcer, or the formation of a new ulcer in the stomach, duodenum, or at the stoma. There are only 5 per cent. of such recurrences. The symptoms of recurrence are those of the original ulcer, unless it be at the stoma, and in these cases the severity of pain after taking food is a marked feature.

Operation is the best and safest procedure for recurrence, but a medical regimen should be given a fair trial. For the cases in which gastro-enterostomy has been performed unnecessarily, disconnection may be performed. If ulceration is associated with a previous gastro-enterostomy, one of the following may be done: (1) Disconnection of the anastomosis and pyloroplasty; (2) disconnection of the anastomosis followed by a second gastro-enterostomy; (3) disconnection with partial gastrectomy. R. V. B. SHIER

OBSTETRICS

Uterine Endoscopy. Rubin, I. C., *Am. Jour. Obst. and Gyn.*, Sept., 1925.

A method of studying the uterine cavity by means of an endoscope is described. In the diagnosis of the cause of uterine bleeding, either from polypi, retained products of conception, glandular endometrial hypertrophy, submucous fibroids or carcinoma, endometroscopy has an almost routine value; under direct vision, a clipping may be taken from the diseased endometrium, and a small lesion may be fulgurated.

An instrument similar to the McCarthy cysto-urethroscope is used. It is slowly introduced into the cervical canal, and thence into the uterine cavity. The uterus is slightly distended with carbon dioxide gas, as in the Rubin test. By gradually withdrawing the endoscope, the entire endometrium may be inspected with very little discomfort to the patient.

E. PERCIVAL

Premature Separation of the Normally Implanted Placenta. Williams, J. W., *Jour. Obst. and Gyn. of Brit. Emp.*, April, 1925.

The article is based on fifty-seven cases of premature separation of the placenta, occurring in the last 9,000 consecutive deliveries at Johns Hopkins Hospital. If external bleeding occurs, the diagnosis is easily made by introducing the finger through the cervical canal, and noting the absence of placental tissue. When the bleeding is retroplacental or concealed, ligneous consistency of the uterus is considered pathognomonic. Shock, in severe cases, is marked and cannot be explained on the grounds of hæmorrhage alone, for retroplacental hæmorrhage never exceeds 750 cc. The uterine musculature becomes dissociated due to the hæmorrhage, and shock is thought to be caused either by this dissociation of the muscle or by the action of some unknown toxin. Trauma, syphilis, inflammation of the decidua, shortness of the umbilical cord, torsion of the uterus, may all be ruled out as productive of the accident. Many of the more severe cases were either preceded or accompanied by pre-eclamptic toxæmia, eclampsia, chronic nephritis, or hypertension. Of the thirty-seven patients who survived delivery fifteen showed no signs of albuminuria during the puerperium. Hence if toxæmia is the cause, its origin and mode of action are unknown.

E. PERCIVAL

Degeneration of Fibromyomata of the Uterus. Seed, L., *Surg., Gynæc. and Obst.*, Sept., 1925.

Fibromyomata of the uterus undergo gross degenerative changes in about thirteen per cent. of

the total number of cases. The degenerative changes occurring include:—(1) Hyaline degeneration; (2) œdematous and cystic degeneration; (3) red degeneration; (4) calcification; (5) infection (of submucous fibromyomata); (6) suppuration.

As fibromyomata have a single arterial supply nearly all degenerative processes are diffuse, affecting all parts of the tumour in the same manner. Hyaline degeneration is apparently the result of the first reaction of the tumour to an insufficient blood supply. Œdematous, cystic and myxomatous degeneration are all part of the same pathological process. Œdema characterizes the first stage. Then the cells undergo destruction by karolysis. Some of these cystic fibroids contain about four gallons of fluid. Clinically they present no untoward symptoms except those due to their size.

Red degeneration is an aseptic necrobiosis with fatty degeneration and thrombosis, caused by a sudden obstruction to the venous channels. Fnally there is a complete fat necrosis and later calcification. The symptoms vary from local tenderness to acute pain with leucocytosis and toxæmia.

Infection of submucous fibromyomata usually occurs in patients near the climacteric, who have had menorrhagia for months, and in consequence are weak and anæmic. Grossly, such a tumour forms a foul smelling, gangrenous mass covered with hæmorrhagic necrotic tissue.

Calcification has little clinical significance, but occurs either as bonelike formation throughout the fibroid or the salts are deposited peripherally in a necrotic one.

The degeneration of a fibroid produces very little toxic effect on the other organs.

E. Percival

ANÆSTHESIA

Chloroform Anæsthesia. Fairlie, H. P., *Proceedings of the Royal Society of Medicine—Section of Anæsthetics,* Sept., 1925.

The writer objects to ether because of the depression of the circulation which follows the use of so strong a stimulant, and also because of the exaggerated breathing which not only results in fatigue to the patient but in abdominal surgery hampers the surgeon. Statistics of deaths under chloroform include those which have occurred in the hands of inexperienced administrators. In the practice of a skilled anæsthetist the mortality with chloroform is no greater than with ether, due regard being paid to the post-anæsthetic period. Recovery from chloroform anæsthesia is characterized by an increase of blood pressure, instead of a fall as with ether, and there is a much smaller liability to chest complications.

Sudden chloroform syncope, caused, the writer thinks, by overdosage, is heralded by pallor and dilatation of the pupils. It should be treated by immediately lowering the head of the table and raising the foot. The Vernon Harcourt inhaler is useful largely because the chloroform vapour is kept of uniform strength. Atropine (gr. 1/100 for an adult) should be given beforehand to prevent reflex inhibition of the heart, through the vagus.

Oxygen should be at hand especially in abdominal operations, where owing to the depth of anæsthesia the blood is insufficiently oxygenated. Postanæsthetic toxæmia is very rare. It is most likely to occur where there is sepsis, especially if the site is in the abdominal cavity. In such cases chloroform should not be used.

W. B. Howell

Quality of the Nitrous Oxide Manufactured in the United States. Hoover, G. W., *J.A.M.A.*, May 16, 1925, p. 1472.

Nitrous oxide is made by the thermal decomposition of ammonium nitrate. It is practically impossible to prevent the formation of some of the higher oxides of nitrogen, such as nitric oxide, and of ammonia and acid impurities. The presence of 117 to 156 parts of nitric oxide per million is dangerous. Nitrous oxide has therefore to be submitted to an elaborate purification. The United States Bureau of Chemistry made a careful survey of this industry. While a few samples showed the presence of traces of nitric oxide none contained a sufficient amount to be harmful.

W. B. Howell

Miscellaneous

"FASHIONS AND FADS IN MEDICINE"*

Fashions in medicine we have, and shall continue to have. But it requires a lens tinted with humour to recognize them and examine them with the proper degree of detachment. Dr. Robert Hutchison's recent address on this subject is so good that it deserves a much fuller reproduction than our space permits.

He begins with a remark made by a friend of his, who after gazing down at an assemblage of doctors at a British Medical Association meeting, turned to him and whispered, "The medical profession in bulk is indeed a saddening spectacle!"

Such a spectacle, Dr. Hutchison points out, is not any more obviously saddening than that presented by any other group of human beings. The cause for melancholy lies rather in the fact that as a whole the profession is far too easily swayed by fashions, a characteristic which was long ago commented on by a certain Dr. Harris, who said: "For some different modes and customs, sometimes perhaps better, sometimes worse, come into Fashion and go out again, in Physick as well as Dress; and the common herd of Physicians too easily give credit to the promises of new leaders, till that faithful Mistress Experience at last shows them safer ways to Truth."

But what is a "fashion, Dr. Hutchison asks. "It is not always easy to say, but I think one may regard transientness as being fashion's essential characteristic. Take, for instance, the matter of hats and hearts. It would not be correct to say that it is the fashion for women to wear hats in England, for I suppose women have worn hats here ever since the Stone Age. On the other hand, it would be quite exact to speak of its being now the fashion to wear what I believe are called *cloche* hats. So in the case of hearts. It would not be accurate to say that it is the fashion to treat heart disease with digitalis, for that remedy has now been in use for close upon a century and a half. But it would be true, or perhaps it would have been true before the war, to say that it is the fashion to send cases of heart disease to Nauheim. Time, therefore, is the essence of the matter."

Their origin is still another question, and a more difficult one to answer. In some cases, however, they may arise out of fads, and the difference between the two is that "a fad is essentially an individual thing; a crotchet or favourite idea held, often independently of evidence, by a single person or by a small group of persons. But sometimes the bees in the bonnets swarm, and then we get a fashion. A fashion, then, may be regarded as an epidemic fad. But in order that a faddist may infect others and make his fad epidemic he must be a person of some importance. You or I might wear any bizarre kind of waistcoat we pleased and no one would take any notice, but if the Prince of Wales, for instance, appears in America in an unusual garment the fashion spreads like wildfire throughout the States. It is very probable, I think, that Bishop Berkeley's tar water caught on as it did largely because he was a bishop; had he been a mere curate he would have been left to drink it alone.

It would be easy, though indiscreet, to mention contemporary examples of eminent fad-carriers who have infected large sections of the profession, and so produced fashions, but everyone will be able to think of such instances for himself.

Fads themselves may be congenital or acquired. "To parody a familiar quotation, some are born faddy, some achieve faddery, whilst some have it thrust upon them. The congenital faddist.... is born with a kink in the brain—an optimist rather than a pessimist, credulous rather than sceptical, lacking in humour, judgment, and common sense. To quote the late Dr. Mercier, 'the faddist is constitutionally incapable of weighing evidence, of suspending his judgment, or of entertaining doubts,' and as Macaulay said, 'he is utterly lacking in the faculty by which a demonstrated truth is distinguished from a plausible supposition.'

"Others achieve faddery, and there are several ways in which this may be done: through specialism is one. The man whose attention is confined to one disease is very apt to become faddy about it and to see it everywhere. ....Tuberculosis officers, for example, are prone to find every lung 'suspicious'."

"Finally, some have faddery thrust upon them by their teachers. Those of us who have the

* Robert Hutchison, M.D., *Brit. Med. Jour.*, May 30, 1925.

duty of training the rising generation of doctors have a great responsibility in this respect. We must not inseminate the virgin minds of the young with the tares of our own fads.... It is always well, before handing the cup of knowledge to the young, to wait until the froth has settled."

Once they get started, however, one can see how they keep going. The chief factor is the herd instinct, the desire to be in the swim, to be "up to date." Further, the public demand for a treatment that has become fashionable, helps to keep it alive. "There is no doubt, for example, that the public, or at least the more educated part of it, often demands from the doctor such methods of treatment as vaccines or psycho-analysis or whatever may be the *dernier cri*, whether his better judgment approves them or no. Fashions are also maintained by the cures which they effect at the outset of their career, for there can be no doubt that every fashion does effect some cures. It does so, we know, through the power of faith and suggestion, which is the meaning of Trousseau's well known advice to a patient, 'Take this *while it is still curing*.' But by and by when the novelty has worn off, the cures cease."

It would be a mistake to take these things too seriously, however. The history of medicine is full of the growth and decline of fashions, "and as individuals we rise on stepping-stones of our dead fads to higher things; fashions and fads do not do much harm to the health of patients, whatever they may do to their pockets, for few of them are really dangerous.... It may even be maintained that the existence of faddists is the price we pay for individual enterprise, and that as a matter of fact, many pioneers in medicine—Jenner, Semmelweiss and Lister, for example, to mention no others—have been denounced by their contemporaries as cranks." Faddism may be regarded as a rough way of ascertaining the truth by the method of trial and error, and on the whole there is "something in" most fashions. Still, the profession may suffer to a certain extent from the pursuing of fashions. "It is bad enough that the saying 'doctors differ' should have become a proverb. But it is worse still that we should exhibit such a collective variability in our views and practice from year to year;....that to-day we should seek to cure all manner of disease by excising the ovaries; to-morrow, by removing the appendix or the teeth; one year by the injection of sea-water, another by the administration of sour milk, or by the application of violet rays...."

Fortunately for medicine there are many with a natural immunity to fashions. Such men are sceptical rather than dogmatic, "pessimists rather than optimists, with a sense of humour and a natural instinct for truth. And the same is true of nationalities. The Scots, for instance, are, on the whole, being a humorous nation, singularly free from fads except in the sphere of religion, though a Scotch faddist, when you meet him, is, like Barrie's Scotchman "on the make," "a fearsome spectacle." America, on the other hand, is I suppose the most fad-and-fashion ridden country on the civilized globe.... It is interesting in this connection to speculate upon the possible effect on our liability to suffer from fashions of the admission of women in large numbers to our profession. Will the woman who has not the courage to wear last year's hat have the courage to prescribe last year's drug?

But even this spirit must not be exaggerated. On the whole, perhaps Pope's advice is best—

> "Be not the last by whom the new is tried,
> Nor yet the last to lay the old aside."

"Finally," Dr. Hutchison remarks, "just as there are fashions in treatments, so there are fashions in doctors. I confess, gentlemen, that I have always been puzzled to explain what makes for success in our profession. It certainly does not seem to be a question of knowledge, nor yet of manners, nor even of character or morals. But if it is difficult to account for ordinary success, it is still more difficult to explain what makes a doctor the 'fashion' in his town or district.... We meet the same problem, of course, in other spheres. Why, for instance, of a thousand novels, all alike *jejune* does one become a 'best seller?' Or why does such a song as (let us say) 'Yes, we have no bananas' sweep a continent, when a hundred others with equally foolish words and no less catchy an air, drop still-born from the lips of the music-hall comedian? 'Sir,' said Dr. Johnson, 'it is in vain to try to explain the inscrutable.'

"....One should not envy the fashionable doctor, rather should one wonder at him. He leads a life of slavery, even though, as a wag said, it is slavery on the guinea coast; and, circumstanced as he is, good and thorough work becomes impossible. His position, too, on a pinnacle is always precarious. He has, it is true, his little day, but he is apt to wake up one morning to find that his worshippers have stampeded *en masse* overnight to some newer shrine of the fickle goddess Fashion."

Obituaries

DR. GEORGE STEWART STRATHY

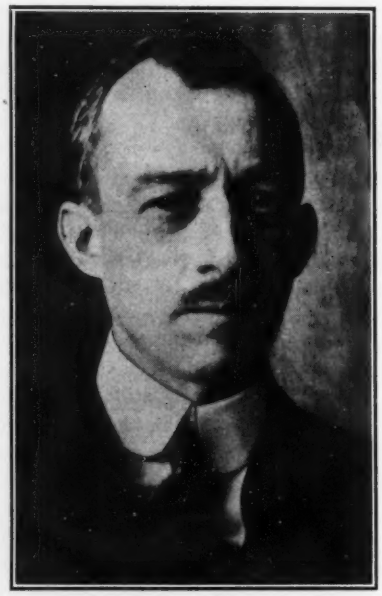
Dr. George Stewart Strathy died in Toronto on June 11th in his forty-second year. One month before his death he was called in consultation to a case of streptococcus pneumonia and, characteristically, assisted the patient to shift himself on the pillow. The same night he had a sore throat, and from that time on felt poorly. Two nights later he rose from his bed to go to the same patient where he spent some time performing aspiration. In a week he became seriously ill, and a few days later pus was found in the pericardium. Drainage seemed well established, and hope ebbed and flowed for three weeks. Finally heart failure set in. One night towards the last, watching his physicians dress the wound, he asked if the tubes were round the heart; his physicians exchanging glances told him the truth gently. "One can always accept the inevitable," he said, and changed the subject.

On the day of his death he recognized his condition, said good-bye to friends and family, and sent for his rector. One of his last directions to one standing by was to give the "job," meaning his funeral, to a certain man who had been in his battalion overseas.

Throughout all this trying illness he maintained without a lapse the bravery, simplicity, and courtesy of manner that had always been his habit, and unwittingly reflected the faith and self-control which always lay behind these qualities.

George Stewart Strathy was born in Barrie, the son of the late John A. Strathy and Agnes Grasett Strathy. His early education was received at the Barrie Public School and afterwards at Upper Canada College. After leaving the latter he entered Trinity Medical School, but as amalgamation took place during his undergraduate years he received his degree in 1905 from the University of Toronto. After a year spent in the Hospital for Sick Children and a year in the Toronto General Hospital he went overseas and spent another year in the London hospitals and obtained the degrees of M.R.C.S., and L.R.C.P. Lond. Before returning to Toronto, he spent some months at the Manhattan Maternity Hospital in New York. When this was completed he returned to Toronto and entered upon private practice. In 1910 he was appointed medical registrar of the Toronto General Hospital; at the same time he attempted some additional work in the Hospital for Sick Children. Shortly afterwards he received the university appointment of Clinical Assistant in Medicine and Demonstrator in Pathology. On the re-organization of the Children's Hospital in 1912 he was appointed clinical assistant to it and during his service carried out some very definite reforms in its organization.

At the outbreak of the war he volunteered for service with No. 2 C.C.S. in April, 1915. He was sent to France in September, 1915, with this unit and was attached to No. 11 Hospital, Boulogne. With the late Dr. Bruce Robertson he was one of the pioneers in getting blood transfusion inaugurated in the service. In 1916, previous to the battle of the Somme, he was attached to No. 44 C.C.S.. In the autumn he rejoined No. 2 C.C.S. as second in command in charge of medicine. Though constantly occupying exposed posts he had long been chafing over not sharing the dangers and hardships of the men in the front line, and in September, 1917, after much opposition, he got himself transferred to the 44th Battalion as Regimental Medical Officer. Here he went through the battle of Paschendaele in which his courage and endurance were recognized by all the members of his battalion. He was invalided to England with trench fever in 1918 and mentioned in despatches. After his convalescence he was placed in charge of medicine in No. 16 Canadian General Hospital, Orpington, where he held the rank of Lieutenant-Colonel, and did excellent work in stimulating others and in organizing medical societies for the discussion of the many problems that presented themselves.



DR. GEORGE STEWART STRATHY

On the reorganization of the Department of Medicine in the University of Toronto after the war, Dr. Strathy was appointed associate in medicine and given charge of the Medical Out-patient Department of the Toronto General Hospital, and the teaching of final year students during term. He threw himself into this work with much enthusiasm, and a large clinic was soon built up owing to the thoroughness and consideration that he gave to all who attended. Dr. Strathy's power of organization was seen at its best in managing a department of this kind. It was the crowning success of his medical life, and he was idolized not only by the patients in attendance but by all his students.

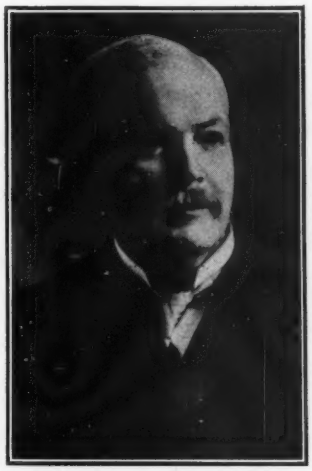
His consulting practice in the city developed rapidly to large proportions, necessitating his giving up much of his private practice. It was characteristic of him that he kept chiefly those patients who were unable to pay for his services and for them he took no end of trouble. At the time of his death he was specially applying himself to the study of "asthma and "arthritis," both in the clinic and in his practice. His observations on arthritis appeared in a paper which he delivered to many local branches of the Ontario Medical Association throughout the province. In the life insurance world he was a member of the Association of Life Insurance Medical Directors of America; and twice, by request, at their annual meeting addressed this body. He also contributed the chapter on "Army Service as an Insurance Problem" to a recently published manual on Life Insurance.

In private life he was a vivacious companion. In holiday time he loved the physical privations of a trip in the north country, and was a master of this type of life. Some years ago he conducted the party of Sir Watson Cheyne up to James Bay.

His funeral service was held in the beautiful old cathedral of St. James, Toronto. Planned at the first as a private ceremony for his family and intimate friends, it developed into a widespread demonstration of sympathy and affection from all those who had been associated with him, a final tribute to a gallant gentleman, a noble doctor, and a heroic soldier.

H. S. HUTCHISON

HUGH A. McCALLUM, M.D., F.R.C.P., LL.D.



HUGH A. McCALLUM, M.D., F.R.C.P., LL.D.

In a very short sketch it is impossible to adequately summarize the personality of the late Dr. McCallum. His professional attainments are well known and I refer to the man, big in body, large of heart and great in mind and soul. I knew him first as a teacher in the Western University Medical School and his dramatic methods of driving home an orderly conception of a subject in a few words, served, as he stated, "pegs to hang your hat on," in a most marvellous way. The student, by reading his Osler, could fill in the sketch he had drawn and make a mental photograph of the subject as a whole. Thus he possessed the power to interest and enthuse his students—the very essence of good teaching. He gave his students work to do, responsibilities that were worth while, and he in turn was ready to teach his craft, whether at the bedside or in the lecture room. The patient was not necessarily used as the basis of a lecture but rather as a problem which developed the resources of the student.

His was a vivid personality, full of energy, hopes and plans, with the Medical School always uppermost in his thoughts. If he could only have lived a little longer to have seen the fruition of his labours! He loved literature, and the association of literary people, and as a consequence had a good working knowledge of the former and numbered many of the latter among his friends. He possessed a fine library, and read it, and he knew how to read, and could retain the salient facts in a marvellous way. As a physician and consultant he was a wise counsellor, always full of cheer, both in appearance and in fact. If there was hope, he left the patient and physician with that as a central and living idea.

Many are the graduates of the Medical School who cherish the memory of this man, who was a central figure in making them what they are. He lives; and he will live on in posterity because he was a builder, and one of the big men that our Canada has produced.

E. SPENCE

Dr. H. R. T. Ross, of Wisconsin, died at his mother's home in Toronto on September the 26th.

Dr. M. C. Black died in Hespeler on August the 23rd in his 67th year.

Dr. T. H. Henry, one of the best known of the profession in Orangeville district, died in Orangeville late in June.

Dr. William T. Harrison, born in the county of Kent in 1846, the oldest graduate of Victoria College, Cobourg, died in Keene on July the 25th. One of the best equipped men of the district, Dr. Harrison had practiced for over fifty years and was well known as a competent surgeon.

Dr. Norman W. Meldrum died in Ayr on October the 2nd in his seventy-eighth year. He had practiced since his graduation as the Starr gold medalist from the Toronto School of Medicine in 1873 for fifty-two years. He is survived by two practitioner brothers, Dr. John Meldrum, of Weston, and Dr. William Meldrum, of Norwich.

Dr. Frances Gordon Zwicker. On the twenty-fifth of September, Dr. Zwicker, of Port Williams, N.S., was the victim of an accident which he survived but a few hours. While motoring to Halifax his car was struck by a train at a level crossing and he sustained injuries which speedily resulted in his death. Dr. Zwicker was a medical graduate of Queen's University, but he never practised as other interests occupied his entire time. For some time he resided in Halifax, but a few years ago took up his residence on his large orchard near Port Williams.

Dr. Lester G. Houle was born at Charlottetown and died on October 2, 1925, at Manitoba Sanatorium aged thirty-five years. About the time of graduation from McGill in 1912, some evidence of tuberculosis sent him to Trudeau, and fixed his special interest in tuberculosis work. He was an assistant at Trudeau for two years, in charge for a time of Lake Edward Sanatorium Quebec, then worked in south and west until the war time need arose when he returned for work under the D.S.C.R. at Regina and at Kamloops. On quitting the superintendency of Tranquille Sanatorium he entered upon practice in Kamloops, associated with Drs. Archibald and Burris. This work he was forced by increasing activity of disease to give up about three years ago.

Dr. Houle was an earnest student, a capable, a very well-equipped practitioner and a man of unusual depth and charm of character. He leaves a widow.

D. A. STEWART

Two active and honoured members of the Canadian Tuberculosis Association have recently died. One was an outstanding public figure in Upper Canada, the other was a zealous, distinguished medical doctor of a French university in Lower Canada. Both died prematurely from ailments due to over-application of nervous and physical effort to the many tasks they were continuously endeavouring to advance. We refer to the late **Sir Adam Beck**, of London, a past president of the Canadian Tuberculosis Association,

XUM

and to the late **Dr. Odilon Leclerc**, a member of our executive and twice the representative of Canada in Europe, at the meetings of the International Union Against Tuberculosis. Their zeal and earnest efforts on behalf of our work should be an inspiration to us all.—*Bulletin Can. Tuberculosis Association*, Sept., 1925.

The many friends of Dr. T. H. Whitelaw, medical officer of health in Edmonton will regret deeply to learn of his loss through the death of his wife, who passed away on the October 10th after a long illness. Her life since her arrival as a bride in Edmonton in 1900 is described as having been a life of service to those in need. Numerous friends not only in Edmonton, but throughout the province will sincerely mourn her death. The members of the profession in Canada extend their deepest sympathy to Dr. Whitelaw.

Fatigue and Susceptibility to Infection.—A review of the various factors that may enter into the conservation of human health and help to determine resistance to disease would reveal a formidable array of proved or assumed phenomena. Environment and heredity can unquestionably be directive influences, but even under conditions in which these are most favourable there may be health hazards that are determined by other personal factors. It has been said that the success of a baneful parasite in invading the body and producing reactions that reach the threshold of clinical symptoms may depend on conditions that either "favour the parasite or disarm the host." Such are the workings of the so-called predisposing causes of disease. They may be described vaguely by such utterly indefinite terms as lowered vitality, decreased resistance, increased susceptibility to infection, or lack of physical stamina. From the standpoint of practical hygiene and preventive medicine, it might be more conducive to progress if the factors were more specifically defined, so that they might be made the subject of direct critical investigation. Some of the harmful influences have been described as exposure to wet and cold, lack of fresh air and sunshine, insufficient or unsuitable food, fatigue and traumatism. One of these, fatigue, has been made the subject of study from the standpoint of its influence on susceptibility to infection. It is generally believed that most disorders of this class, as smallpox, measles, epidemic influenza, infantile paralysis, typhoid, tetanus and yellow fever, have little or no relation to bodily vigor. On the other hand, there is a widespread assumption that predisposing factors are concerned in the immunity to such infections as tuberculosis and pneumonia. Bailey induced fatigue artificially in varying degrees of severity in experimental animals, and observed their relative susceptibility to intratracheal injections of pneumococci. The results seem to indicate that acute fatigue, in the form of physical exhaustion, and chronic fatigue, in the sense of training, are followed by quite opposite effects in the case of pneumonic infection. The first seems to render the animals more susceptible; the second, less susceptible. It would be premature to dogmatize on such preliminary observations under conditions not always easy of exact evaluation. Nevertheless, it need not be concealed that Bailey's findings, as he himself concludes, agree with the general belief that sudden overwork and strain may be detrimental, whereas physical training may increase resistance to certain infections.—*Jour. A.M.A.*, Sept. 26, 1925.

Tuberculosis in Halifax.—The reduction in death rate from all forms of tuberculosis from 237.3 per hundred thousand in 1909-10 to 133.6 in 1923-24 is a reduction of 43 per cent. During the same period the provincial death rate from all forms dropped from 196 per hundred thousand to 125, a reduction of 36 per cent.

All these reductions are due in large measure to the modern public health agencies of which the Massachusetts-Halifax Health Commission is one. It is felt, however—speaking particularly with reference to tuberculosis—that much more could be accomplished. The public needs more education from the textbooks of Prevention and Cure. The younger generation requires further protection. We now have open-air classes in three school houses with accommodation for over sixty children. More of these should be opened all over the city. The fresh-air camp at Rainbow Haven during July and August this year has taken care of 150 boys and girls—many of them tuberculosis contacts—for two weeks at a time. Next year they hope to do more. But a preventorium is indispensable.—*Bull. Can. Tuberculosis Assn.*, September, 1925.

Association Notes

MILITARY HOSPITALS, D.S.C.R.

Recently correspondence has been carried on between this Association and the Federal Government relating to the vexed question of the administration of our Military Hospitals. We have permission to print this correspondence and desire to draw the attention of our readers to the very definite expression of policy to which the Honourable Minister of the Department concerned has subscribed.

——

August 19, 1925.

The Honourable W. L. Mackenzie King,
Premier of Canada,
Ottawa.

Dear Sir:—

It has lately been drawn to my notice that it is the intention of the Minister of the D.S.C.R. to replace in some of the hospitals under his department medical superintendents by lay superintendents.

In the absence of the Chairman of our Council, Dr. Alex Primrose; and because of the illness and enforced leave of absence of our Secretary, I take the opportunity of addressing you on the subject.

I have not the fyle before me and therefore cannot quote exact dates.

You will recall that when a similar change was projected for the Ste Anne de Bellevue Hospital a delegation of this Association waited upon you at Ottawa, and strenuously objected to the proposed change in policy being carried out. This objection was based upon the conviction that our returned soldiers were deserving of the best medical treatment that the country could provide and that the tendency of modern hospitals was to eliminate lay superintendents by the appointment as superintendent of a medical man specially trained in hospital administration.

The delegation was advised by yourself and by your Minister that plans had gone too far to be withdrawn; that the change was in the nature of an "experiment" and would not apply to any other hospital of the department; and that the sole object was economy of administration without in any way sacrificing the best interests of the soldier patients.

At the annual meeting of this Association held in Ottawa in June, 1924, a resolution was passed, and forwarded to the Minister, regretting that this action had been taken.

At the recent annual meeting held at Regina, June, 1925, a further condemnatory resolution was passed, which resolution has undoubtedly ere this reached the Minister of the Department.

If the reports referred to in my first paragraph are true I can, on behalf of this Association, but express my astonishment that the Minister of the Department chooses to completely ignore the expressed views of the organized medical profession of this country.

Furthermore, I am prepared to say that, in our opinion, an investigation of the Ste Anne Hospital would prove not only that the "experiment" is an economic failure, but, as is well known locally, there have been instances of grave and serious failure as regards the treatment of patients, due entirely to the absence of that supervision which alone is ensured by medical superintendence.

In your acknowledgement of this communication, which I respectfully request, I trust you will be able to assure me that these rumours are false.

Sincerely,
(Sgd.) ALFRED T. BAZIN.

———

August 19, 1925.

The Honourable Dr. Beland,
Minister, D.S.C.R.,
Ottawa.

Dear Sir:—

I enclose herewith copy of letter which I forwarded to the Premier, which letter speaks for itself. I trust that in the Premier's reply the rumours will be declared quite unfounded, as I hesitate to think that you or your department would take such a step in spite of protest from our profession.

Sincerely,
(Sgd.) ALFRED T. BAZIN.

———

Department Soldiers' Civil Re-establishment.
Minister's Office,
Ottawa, August 20, 1925.

Dear Doctor Bazin,

I beg to acknowledge the receipt of yours of yesterday's date, together with copy of a communication addressed to the Prime Minister in connection with medical superintendents of hospitals, etc.

Let me reassure both yourself and the Canadian Medical Association with regard to our hospitals. There is no intention on my part, or on the part of the government, to replace medical superintendents by lay superintendents.

Rumours have been set afloat undoubtedly on account of certain slight changes we were intending to make in the clerical staffs in the different units. We had thought that some saving could be effected by merging all the clerical staffs into one. This would not in the remotest degree have affected the prerogatives of the medical officials, but as there seems to be some apprehension in some quarters over this move, I have issued instructions to the Deputy Minister to postpone indefinitely the contemplated action.

In conclusion, let me express the hope that you are now satisfied that the rumours are false.

Believe me,
Yours truly,
(Sgd.) HENRI S. BELAND

Doctor A. T. Bazin,
Canadian Medical Association,
836 University Street,
Montreal, P.Q.

August 25, 1925.

The Honourable Dr. Beland,
Minister, D.S.C.R.,
Ottawa.
Dear Dr. Beland:—

I beg to acknowledge yours of the 20th inst, which came into my hands to-day upon my return to the city.

On behalf of the Canadian Medical Association I thank you for your frank statement of policy as regards the administration of D.S.C.R. hospitals. This statement effectively settles the question raised by the rumours referred to in my letter of August 19—addressed to the Prime Minister.

Permit me to assure you, however, that the Canadian Medical Association does not in the slightest degree desire to oppose any measure which will result in economy of administration, and it would appear as if a merging of clerical staffs might easily be effected without loss of service to the patients.

The Association is not concerned with the "prerogatives of medical officials" except insofar as the special training of the individual enables him to administer his position with greater effectiveness.

In conclusion, may I suggest that you will at all times find this Association prepared to cooperate with your department in the study and solution of the problems arising in connection with the care and treatment, hospital and otherwise, of disabled soldiers.

Thanking you for the courtesy of your communications,

I remain,
Yours truly,
(Sgd.) ALFRED T. BAZIN.

September 3, 1925.

The Honourable Dr. Beland,
Minister, D.S.C.R.,
Ottawa, Ont.
Dear Dr. Beland:—

After consultation with our General Secretary, Dr. Routley, we have decided that it would be in the best interests of your department respecting the rumours regarding change of policy in hospital administration, were your letter of August 20 and the correspondence associated therewith published in the *Canadian Medical Association Journal*.

We feel that such publication would reassure the members of the Association and set at rest any rumours afloat which are disquieting and which undoubtedly have a bad influence upon the service rendered in those hospitals.

Please let me know by early mail if you concur in this decision.

Sincerely,
(Sgd.) ALFRED T. BAZIN.

Department of Soldiers' Civil Re-establishment.
Minister's Office,
Ottawa, September 28, 1925.

Dear Sir:—

I am desired by the Honourable Dr. Beland to advise you that he has no objection to your publishing his letter of the 20th August respecting the rumours regarding change of policy in hospital administration, as requested in your communication of the 3rd instant.

Dr. Beland regrets that a word could not be given you sooner, but his continued absence from the city prevented this.

Yours very truly,
(Sgd.) MARC A. LAVOIE,
Private Secretary

Dr. A. T. Bazin,
Canadian Medical Association,
Montreal, P.Q.

Medical News from the British Empire

GREAT BRITAIN

LETTER FROM LONDON

The subject of high blood pressure has lately been studied rather fully; at the Bath meeting of the British Medical Association there was an instructive debate on this topic.

The type of high blood pressure associated with arteriosclerosis was not the one under discussion; but a form evident in quite young people where the systolic pressure is observed to be far above the normal for their age. The condition seems congenital; and clinicians appear disposed to regard it as a disease *sui generis* and have named it hyperpiesis.

Lord Dawson of Penn laid it down that a systolic pressure of from 115 to 130 millimetres of mercury is the normal for ages from twenty to twenty-five years, and that a diastolic pressure of from seventy-five to eighty should go with that, giving a pulse-pressure of from forty to fifty millimetres of mercury. "A diastolic pressure of above 100 is very suspicious." His lordship described a type of high blood-pressure found in about eight per cent. of children where the systolic pressure was higher than 120 mm. of mercury. But there is no arteriosclerosis; the radial arteries are soft, and there is no excess of uric acid in the blood. The arterioles, however, are unduly responsive to vaso-motor innervation which is the same thing as saying that the vaso-motor centre itself is unduly sensitive. These children have cold hands and feet arising from a relatively bloodless condition the result of spasm of the arterioles whereby the capillaries are continuously imperfectly filled with blood.

In order to study the vaso-motor centre under conditions in which it can be made to receive blood independently of the body whose vessels it innervates, Professor Starling, F.R.S. (University College) has devised a cross-circulation experiment of great interest.

A dog (A) is selected and its carotids ligated in order to prevent its heart supplying its own brain. Its cephalic circulation and therefore its medulla oblongata is supplied by the heart of a second dog (B), while its lungs, body and limbs are still supplied by its own heart. Professor Starling found: (1) that when the blood pressure in the vaso-motor centre of A is raised, the pressure in the systemic vessels of A is *reduced*, which can only mean that the vaso-motor centre of A is now innervating less intensely the arterioles which, therefore, dilate. In other words, the high blood pressure in A's medulla causes A's vaso-motor centre to become to some extent inhibited, with the result that A's systemic arterioles dilate and therefore A's blood pressure falls; the object clearly being to lower the pressure in A's vaso-motor centre. Of course this last does not occur, since A's centre is being supplied by blood from B's heart under high pressure.

(2) Conversely, when the blood pressure is caused to fall in A's vaso-motor centre, A's systemic blood pressure *rises* owing to A's vaso-motor centre now emitting more rigorous vaso-constrictor impulses to its systemic arterioles. The object of this rise of blood-pressure in the body of A is evidently to force more blood into A's cephalic circuit and compensate the low blood pressure there.

Briefly, when the pressure in the cerebral circuit falls, it rises in the systemic, and vice versa; in other words, the state of an animal's systemic blood pressure is always such as shall ensure an adequate flow of blood to that animal's brain and medulla.

This is an additional proof, if such were needed, of the functional pre-eminence of the central nervous system, and of the subservience of the rest of the body to the "master tissue."

In the course of an investigation into blood pressure in school children it was ascertained that the blood pressure of the scholars was higher in those schools in which the discipline was good than in those in which it was bad.

The circles of psychological medicine have been stirred up by the attitude taken by Professor J. Shaw Bolton, of Leeds University, in his Maudsley Memorial Lecture at the quarterly meeting of the Medico-Psychological Association this summer.

Dr. Bolton is an uncompromising anti-Freudian; he is one of those who will not bow the knee to (the Austrian) Baal. Of the unconscious mind in particular he is very suspicious. He can find no description or definition of it. It is credited with the most remarkable performances; it is an epitome of the experience of the race; it is an omnipotent agent for good or ill apart from and often in opposition to the will of the individual; it is a mystery. It seems to have been in existence long before the memoric substratum of the conscious mind has been differentiated, since, according to Freud. it can remember or retain impressions reecived from events of intra-uterine life. It is altogether too wonderful!

Seeing that Freud's interpretation of dreams is built up very largely on the forms and peculiarities of this unconscious mind, Dr. Bolton ventures to cast a great deal of suspicion on this ingenious and complicated system of introspective psychology. One may indeed be allowed to be suspicious of the existence of a mental mechanism so elaborate as the unconscious mind whose activity is confined to a region of such extreme inaccessibility.

The lecture covers a wide field, for the evolution of brain and "mind" is traced from its earliest manifestations in arthropods through birds and mammals to man. Professor Bolton differs sharply from Professor MacDougall, of Harvard, in denying intelligence to the "social" insects. He said, "It is my intention to indicate that the evidences of purposeful action which are exhibited by insects in high degree are based primarily on their ancient racial life and are not indications of intelligent activity." Dr. Bolton thinks it is sixty million years ago since the arthropoda appeared in the Caribbean Seas; two millions of years since mammals first put in an appearance; one million years ago since they reached "a humanoid stage"; 200,000 or 300,000 years ago since man appeared, and only about 7,000 years ago since man was civilized. An illuminating portion of the lecture is that on personality. Dr. Bolton's own words are: "With the rise in the mammalian scales the instinctive element becomes more and more subordinate to the personality and merely assists or limits the activity of the latter." "The normal personality of a human individual at any time is the conscious activity of his mind and brain with the help of present experience and of all such past experience as can be recalled voluntarily or aroused by association.

"Our experience being recorded in time on the one hand and from the aspect of our bodily parts on the other, the fact that time-related portions of exper-

ience, and all knowledge that portions of our bodies in the popular sense may respectively become, as it were, blotted out or switched off from the remainder, often as the result of nervous shock, is easily intelligible. The former serves as the basis of multiple personality, and also of permanent delusional states, and the latter as the course of hysterical palsies."

London, September 29, 1925. D. FRASER HARRIS

AUSTRALIA

We learn that energetic measures are being taken to check the spread of epidemic poliomyelitis in Australia, the disease being particularly prevalent in the city of Melbourne and the neighbouring area. The history leading up to this outbreak is significant. In 1918 there was an epidemic of poliomyelitis in Victoria, with 303 cases and twenty-one deaths, or a mortality of seven per cent. During the following years the number of infections notified was inconsiderable, varying from two to twenty-three in each year, reaching a total in the six years of seventy-six, but out of this number there were twenty deaths. So striking a disproportion in mortality made it seem reasonable that only a few of the infections were reported, and therefore when the numbers reported in 1923 began to show an increase this was considered more apparent than real. There was a serious epidemic in New Zealand at the time, and this together with the gradual education of the public with regard to the taking of early precautions, may have accounted for the greater number of notifications. Still, the situation was serious enough, for in the first six months of the year ninety-three infections were notified, with eleven deaths.

Great difficulties are met with in the control of outbreaks of this disease, for the method by means of which the infection is spread is still unknown. The next best step is to seek out the manifest sources of infection and render them harmless to the community as soon as possible. The public health authorities are following the plan of injecting the serum of patients who have recently recovered from a frank attack, and there is evidence already to show that this method is of considerable value in controlling the course of the disease.

The subject of maternal morbidity and mortality is one which is occupying very fully the attention of the medical profession in Australia. The Melbourne Permanent Committee for Post-Graduate work has awarded its prize for an essay on this subject to Dr. E. S. Norris, and it has been published in the *Medical Journal of Australia*, September 12, 1925. Some of the conclusions drawn are as follows:

While the death rate from general causes has been declining, the puerperal mortality rate in Australia has been rising. There is little doubt that the total maternal morbidity far exceeds the mortality from pregnancy and childbirth. Large centres of population even with their improved facilities for treatment are not necessarily the safest places for the delivery of a pregnant woman. The midwife's respnsibility in the causation of maternal morbidity is not as great as is usually thought; the medical profession must assume a larger share of such responsibility, but, at the same time, it is realized that the control of midwives by the present methods is not satisfactory. No noticeable improvement has resulted from the maternity bonus. Artificial abortion and venereal disease are mentioned as important factors in the production of this maternal morbidity and mortality and treatment of the latter under existing conditions is extremely unsatisfactory. There is also criticism of the present teaching in clinical and practical midwifery and it is felt that more prominence should be given to the preventive aspects of the subject. Until the value of antenatal care and supervision is fully recognized it is felt that no great advance will be made from the present unsatisfactory condition.

Further evidence of the efforts which are being made towards the improvement of obstetrical practice is seen in a recent gift of £10,000 for obstetrical research. This has enabled the University of Melbourne to appoint a director of this research, at the salary of £2,500 per annum for two years. He is to be a practitioner who can show evidence of extensive obstetric practice gained in Australia, and will be required to devote his full time to the subject, chiefly with a view to the investigation of the causes of maternal morbidity and mortality in the State of Victoria. His work will also include an examination of the methods of teaching obstetrics and of training nurses for this work.

SOUTH AFRICA

The following remarks are taken from an editorial in the *Medical Journal of South Africa* (August, 1925). They are another evidence of the insistent demands that preventive medicine be given more attention.

"....the profession in the Union should devote more attention than has hitherto been given, to antenatal care. Such care, to be effective, must be given under proper conditions which allow a systematic and complete examination of the mother, and of careful team work. It cannot be given under the loose arrangements now existing in municipalities or hospitals, for under such conditions its results will be nil while its cost will be excessive. The profession must insist, and must educate the public to insist, on the establishment of properly staffed and equipped ante-natal centres, preferably in connection with existing maternity hospitals, and partly supported by the local authorities. As the matter is of national importance, however, it is reasonable to look to the central government to finance such establishments in part, and as the education to be derived from them is of importance to the medical student, the universities should also contribute towards their upkeep, and take an active interest in their work. Now that public interest has been slightly stirred by the remarks of the Hospitals Committee in regard to the want of correlation of child welfare work, the time is perhaps ripe for a forward move in the direction of establishing such centres."

News Items

GENERAL

MEDICAL LIBRARY ASSOCIATION AND HIGH COST OF GERMAN MEDICAL PUBLICATIONS

At the annual meeting of the Medical Library Association held in Atlantic City in May, one of the most important subjects under discussion was the present attitude of the German medical publishers in the high prices charged foreign subscribers for their medical publications and the greatly increased output of their periodicals.

In compliance with the action taken, the Executive Committee is now making an investigation of this matter. As a result of its findings, it is to decide whether or not concerted action on the part of medical libraries of America will cause the German publishers to curtail their output and reduce the cost of their publications to their American customers.

A number of the libraries in the Association have donated freely of their duplicates and other organizations have provided subscriptions for American medical publications to aid German libraries and physicians in replenishing their depleted files and in acquiring current literature. It appears from the action of the German medical publishers toward American purchasers of their publications that this evidence of good will and co-operation on our part has been, and is, little appreciated.

All individual subscribers and purchasers of German medical publications are asked to lend their endorsement to the effort now being made by the libraries. Those willing to join in the movement in order to bring about united action on the part of both libraries and individual subscribers are requested to communicate with Miss Margaret Brinton, Librarian, Mayo Clinic, Rochester, Minnesota.

FREEING PRINCE EDWARD ISLAND FROM BOVINE TUBERCULOSIS

During the early part of 1925 negotiations were entered into between the Federal Department of Agriculture at Ottawa and the provincial department in Charlottetown with a view to making the province of Prince Edward Island free from bovine tuberculosis. The first step taken was to secure a two-thirds vote of all the cattle owners of the province signifying their willingness to co-operate in the movement. Very little trouble was met in securing the vote necessary, as every one realized what a great boon it would be to the Island to have all its herds brought under the test. The Island lends itself very readily to such a plan, for with practically only one port of entry the importation of stock from outside points can easily be controlled and the danger of contamination eliminated. The cleaning up of the dairy herds will be a great benefit to the province. The health of the people is of course the first consideration and a supply of pure milk, especially for growing children, cannot but be beneficial. Moreover, the dairy products (butter and cheese) will in future be stamped "Products of a Tuberculosis-free Area," which should appeal strongly to the consuming public.

The work is not yet finished over the entire island, but the result so far is highly satisfactory. The testing was begun in the vicinity of Charlottetown where on account of the large importations of pure-bred stock from other provinces one would naturally look for a higher percentage of reactors. The returns for the first three weeks' work show only one hundred and nine reactors out of a total of twenty thousand six hundred and sixty, or less than one-half of one per cent. We have every reason to believe that this percentage will not be increased as the work proceeds.—*Bulletin of Canadian Tuberculosis Association*, September, 1925.

The Canadian National Committee for Mental Hygiene report that there are now 161 special classes giving training to 2,400 children. These classes have come into being during the last few years, and are of inestimable value from the standpoint of mental hygiene. It is estimated that we have in Canada 32,000 sub-normal children attending our public schools, and for these, 1,600 auxiliary classes are required to meet this important educational need.

At the last meeting of the Board of Directors Mr. A. F. C. Fisk, of Montreal, Third Vice-President of the Metropolitan Life Insurance Company, was elected a member of the board. Mr. Fisk is vitally interested in all matters pertaining to public health, and the National Committee is fortunate in securing the benefit of his advice and co-operation.

The Laura Spellman Rockefeller Memorial recently granted $100,000.00, spread over five years, for the establishment of nursery schools of the laboratory type at McGill University and at the University of Toronto. This will enable Canadian scientists to study under ideal conditions the factors of mental growth in children. At the present time we are ignorant of the best conditions for the development mentally and physically of young children of slightly defective mentality and for this reason the nursery schools afford valuable opportunity for psychologists, psychiatrists, physiologists, dietitians, and other scientists carrying on studies which may increase our knowledge.

The progress of mental hygiene in Canada will depend upon able leadership. Through the generosity of the Rockefeller Foundation and the Laura Spellman Rockefeller Memorial, travelling fellowships in mental hygiene have been awarded to Canadians who will return to the Dominion to carry on important medical and social work. The following have been recipients of Rockefeller fellowships:

Dr. Arthur W. Young, a graduate of McGill University. Dr. Young is at present in Europe preparing himself for mental hygiene research in Canada.

Dr. E. P. Lewis, a graduate of the University of Toronto and a medical officer for several years in the Department of Soldiers' Civil Re-Establishment in the Division of Neurology. Dr. Lewis is pursuing studies over a term of one and a half years that will make him a valuable specialist in the field of child guidance.

Any effort made to honour and commemorate Canadian bravery and Canadian sacrifice in the Great War demands attention and so far as may be possible, assistance. We have therefore much pleasure in calling the attention of our readers to the beautifully illustrated number of the *Municipal Review of Canada*, which will appear on Armistice Day with illustrations of all the war memorials erected in Canada. All profits from the sale of this volume go to help the funds of war-widows and orphans. We commend the volume to the attention of all our readers.

NOVA SCOTIA

The 1925-26 session of the Medical School of Dalhousie University opened on the ninth of September. Owing to the limitation of the size of classes in the clinical years, which now for the first time affects the graduating class, the registration is less than last year, but is nevertheless very satisfactory.

The new pathological building of the Victoria General Hospital, Halifax, has been completed and is now in full commission. The building is of four storeys, each measuring 105 by 60 feet. The down floor is given over to the autopsy rooms, clinical laboratories, service rooms and students' coat rooms. On the main floor are the principal offices, the museum with its auxiliary rooms, and a commodious demonstration room. The next floor is designed for teaching purposes, and includes a large students' laboratory, a lecture theatre and a departmental library. The uppermost floor provides accommodation for the laboratories of the Provincial Department of Health. In the planning of the building, much care was taken to assure the utmost convenience of administration. The interior finish is excellent in every respect, and the equipment is very complete. Several research laboratories have been included so that the hospital is in a much better position than formerly to carry on its clinical work with proper laboratory co-operation. As the Dalhousie medical students receive their instruction in bacteriology, pathology and public health laboratory work in this building, its completion adds materially to the teaching facilities of the university.

The corner stone of the new bulding for the Colchester County Hospital, at Truro, was laid with appropriate ceremonies on the fifteenth of September. Construction work is already well advanced, and it is expected that the new building will be occupied and the present building evacuated in May of next year. The operating room of the new hospital is to be dedicated to the memory of the late Dr. W. S. Muir who, for many years, practised in Truro and was one of the most distinguished practitioners in the province. Dr. E. A. Randall, the president of the Hospital Trust, presided over the ceremonies, and outlined the history and accomplishments of the institution. The corner stone was laid by Honorable J. C. Douglas, Attorney General of the province, who represented the governor of Nova Scotia on the occasion. Dr. Douglas referred in fitting terms to the value of hospitals in community service and in the furthering of public health interests. Addresses were also delivered by Mr. Harold Putnam, M.P., for Colchester County; Dr. A. C. Jost, Provincial Health Officer and Mayor Murray of Truro.

In *Public Health Notes* for September, the Provincial Health Officer again calls attention to the rising death rate from cancer in Nova Scotia. Last year the cancer death rate equalled that of tuberculosis. Practitioners in industrial districts have frequently expressed the opinion that cancer is relatively less common among the foreign born than among the native born. The question is asked if a study of the incidence of cancer in counties in which certain racial stocks predominate might not prove of value in estimating a possible bearing of racial origin on the cancer rate. In Richmond County, approximately 65 per cent. of the people are of French ancestry; in Pictou County, approximately 70 per cent. are of Scotch ancestry; in Lunenburg County approximately 60 per cent. are of German descent; in Shelburne County from 60 per cent to 65 per cent. are of English origin. When Dr. Jost asks a question he does not rest until it is answered, so it may be taken for granted that he is already deep in an analysis of statistics, and that in due time we will have a report in this matter quite as valuable and comprehensive as his carefully considered studies of statistical evidence relative to several other conditions.

The vital statistics for May last, show a considerable increase in tuberculosis deaths as compared with the same month of the previous year, but a notable reduction in the number of deaths from pneumonia, influenza and other communicable diseases. The total deaths for the month numbered 521, as compared with 566 in May, 1924. The infants mortality rate for the month was 81.1—an increase of 4.2 over 1924.

The Yarmouth Medical Society of many years standing, and the younger Western Counties' Medical Society recently became merged into a new organization which has been named the Western Nova Scotia Medical Association. Dr. E. V. Hogan, president of the Medical Society of Nova Scotia, presided at the meeting at which the amalgamation was effected, and fifteen physicians became charter members. The counties of Digby, Yarmouth and Shelburne will be served by this association, which will have a normal membership of at least thirty. The following officers were elected: President, Dr. C. A. Webster, Yarmouth; Vice-Presidents, Drs. H. J. Pothier, of Weymouth; C. J. Fox, of Pubnico, and L. P. Churchill, of Shelburne; Secretary, Dr. T. A. Lebbetter, Yarmouth. Dr. A. R. Campbell, Yarmouth, was appointed to represent the Association on the executive of the Medical Society of Nova Scotia.

The autumn meeting of the Valley Branch of the Medical Society of Nova Scotia was held at Digby on the second of October, with the president, Dr. E. V. DuVernet, in the chair. Following the recommendation of the provincial society, it was decided that the medical men of Digby County should exercise the privilege of uniting with either the Valley or the Western Nova Scotia branch, or both. It was decided to hold the annual meeting at Wolfville, in May next. A resolution was passed favouring greater attention to the provisions of the vaccination law. Interesting papers were read as follows: Résumé of Cardiology, by Dr. W. R. Dickie, of Barton; Problems of Interest to the General Practioner arising out of Eye, Ear, Nose and Throat Conditions, by Dr. J. A. M. Memmeon, of Wolfville; Abortion, by Dr. V. L. Miller, of Halifax; Surgery of Pulmonary Tuberculosis, by Dr. J. H. Allingham, of St. John. At 6.30 the members adjourned to the Travellers' Inn for dinner. At this function Dr. Allingham conveyed the greetings of the St. John profession and advocated the revival of the Maritime Medical Association with one official journal.

The annual meeting of the Eastern Counties Branch of the Medical Society of Nova Scotia was held at Antigonish on the 6th and 7th of October. Addresses were given by Drs. G. H. Murphy and S. R. Johnston, of Halifax, and R. F. MacDonald, of Antigonish. Dr Murphy dealt with several surgical problems, Dr. Johnston with the x-ray, and Dr. MacDonald with certain diseases of the eye. Dr. J. J. Cameron, of Antigonish, also exhibited a number of x-ray plates made at St. Martha's Hospital. A large part of the time was given to clinical work at the hospital. Officers elected were as follows: Hon. President, Dr. George E. Buckley, Guyborough; President, Dr. J. L. MacIsaac, Antigonish; Vice-Presidents, Drs. J. J. McRitchie, Goldboro and R. F. Macdonald, Antigonish; Secretary, Dr. P. S. Campbell, Port Hood. Dr. W. F. MacKinnon, Antigonish, was appointed to represent the branch on the executive of the Medical Society of Nova Scotia.

The Colchester-Hants Branch of the Medical Society of Nova Scotia devoted its meeting on the 29th Septem-

ber to a celebration of the jubilee of Dr. Robinson Cox, of Upper Stewiacke, as a medical practitioner. The meeting was held at Truro, under the presidency of Dr. R. D. Shatford, of Londonderry. Many medical friends of Dr. Cox from various parts of the province were in attendance. At the afternoon session Dr. Cox related the particulars of a case of hydrophobia he had treated in the early days of his practice, which had developed four years after a bite by a rabid dog. Among the speakers at this session were Dr. John Stewart, who represented Dalhousie University, Dr. E. V. Hogan, president of the Medical Society of Nova Scotia, Dr. W. B. Moore, of Kentville and Dr. J. G. MacDougall, of Halifax. All referred to the splendid record of Dr. Cox, and to the high regard in which he is held by his professional confrères. In the evening a complimentary banquet was tendered to Dr. Cox, at the Learmont Hotel. Thirty-five colleagues besides other friends sat with Dr. Cox, and, after the repast had been enjoyed and the King toasted, an address prepared on behalf of the branch society was presented to Dr. Cox by Dr. H. V. Kent, together with a gold headed cane. In his response, Dr. Cox acknowledged feelingly the honour being done to him, and indulged in some interesting reminiscences of his early days, referring among other things to the formation of the Colchester Medical Society in 1883, of the original membership of which he alone survives. The amalgamation of the Colchester and Hants Societies took place in 1907. Then followed a toast list which brought many men to their feet for short but happy speeches. The evening proved most enjoyable in every respect. Among other matters of business, a resolution was passed urging better enforcement of the vaccination law, and Dr. D. S. McCurdy was appointed to report the proceedings of the branch to the *Nova Scotia Medical Bulletin*.

W. H. HATTIE

QUEBEC

Dr. Alfred Desloges, who has been an interne in eye, ear and throat department of the Hotel Dieu Hospital for the past two years, has been appointed "Fellow in Opthalmology" at the Mayo Clinic, Rochester, Minnesota, and left a short time ago to take up his new position. Later he will continue his medical studies in Europe. He is the son of Dr. A. H. Desloges, medical director of asylums for the insane in the Province of Quebec.

The advisability of teaching family hygiene in all primary schools in Quebec, to girls over the age of thirteen years, was considered by the sub-committee of the Catholic Committee of the Council of Public Instruction. Two reports were prepared and will be taken up at a meeting of the whole council. Hon. J. J. Guerin, Montreal, president of the sub-committee will submit the resolutions.

The Leeuweenhoek medal has been awarded by the Royal Academy of Sciences of Amsterdam to the Canadian scientist, Felix D'Herelle, director of the bacteriological laboratory at Alexandria, Egypt, and counsel to the Maritime Sanitary Authority of Alexandria. The Leeuwenhoek Medal is awarded every ten years to the scientist who in this period has made the most important discovery in microscopical research. The medal is named after Anthony Leeuwenhoek, Dutch microscopist, born in Delft in 1632, who made many interesting discoveries in the minute anatomy of man and animals.

Dr. Maude E. Abbott, B.A., C.M., M.D., has recently returned to Montreal, after spending two years in Philadelphia, where she reorganized the department of pathology and bacteriology at the Women's Medical College of Pennsylvania.

Six new x-ray machines, of the most modern type have been installed by the Board of Governors at the Montreal General Hospital. By means of these not only will much time be saved but work can be carried out which was impossible with the old machines. A bedside machine takes care of the smaller work. Dr. W. L. Ritchie, head of the department, stated that this was the second equipment he had helped to install during the year. He pointed out that the large machine for the investigation of abdominal trouble and another smaller one were equipped with brass tubes, which conserve electricity, and make for the safety of the patient and operator.

An endorsement of the resolution passed last week by the Child Welfare Association at Ottawa, urging the government to make more rigid laws on child immigration, was sent to the Department of Immigration by Dr. A. H. Desloges, director of insane asylums and reformatory schools in the Province of Quebec. Quoting figures regarding the past experience of the country, Dr. Desloges urged greater care in the admission of children. In the provincial reformatory schools a year ago thirty-three of the 115 inmates were foreign born, coming mostly from the British Isles and Russia, and the problem was even more serious in western provinces, where organizations such as the Barnado Institute had been responsible for bringing out children, of whom a large percentage were mentally deficient. Dr. Desloges urged that the examination of applicants for admission to Canada be made more thorough and that medical officers should insist on obtaining the certified family history of all children admitted.

Lord Dawson of Penn, who is paying a short visit to Canada and the States spent a few days in Montreal on his way to the meeting of the Tri State Medical Society in Minneapolis. McGill University at the Autumn Convocation conferred upon him the degree of LL.D. and the Medico-Chirurgical Society had the pleasure of listening to an address by him on Physiological Habit, an address which we hope shortly to publish in our *Journal*.

GEO. HALL

ONTARIO

On August 12th, District No. 9 of the Ontario Medical Association, comprising the Counties of Algoma, Temiskaming, Sudbury, Nipissing, Parry Sound and Muskoka, held a most successful district meeting at Sudbury, under the direction of the counsellor of the district, Dr. W. J. Cook. During the morning, a very excellent clinic on pulmonary tuberculosis was conducted by Dr. C. D. Parfitt, of Gravenhurst. The members sat down to luncheon at 12.30 p.m. at the Nickel Range Hotel. The following programme was presented in the

afternoon:—Appendix Dyspepsia, Edgar Brandon, North Bay; Some explanations of low back pain with consideration of sacro-lumbar and sacro-iliac lesions, C. S. Wright, Toronto. This was followed by a visit to the nickel smelters at Copper Cliff and Coniston, and to the golf club. Following dinner at the Nickel Range Hotel, the day's programme was concluded with addresses by the following: John A. Macgregor, President of the Ontario Medical Association; S. L. Alexander, "Headaches of nasal origin"; J. H. Duncan, Sault Ste. Marie, "Injuries to the Elbow."

There was an excellent attendance from all parts of the district, the programme was greatly enjoyed by all present, and the meeting was considered one of the most successful that the district has yet held. Unfortunately, owing to illness, the general secretary, Dr T. C. Routley, was unable to be present.

Medical men and their wives, to the number of approximately one hundred, from the counties of Haldimand, Lincoln, Welland, Wentworth, and Halton, attended the annual meeting of Number 4 District of the Ontario Medical Association in Niagara Falls, Ontario, on Wednesday, September 9th. The conference was in charge of Dr. J. H. Holbrook, Counsellor of the District, assisted by Dr. John Sheahan, of St. Catharines, Vice-Counsellor of the District, and Dr. Smillie, of Niagara Falls, President of the local society.

The morning was devoted to clinical work at the Niagara Falls General Hospital. During the afternoon, cases were presented as follows:—Multiple sclerosis, J. G. Harkness; the Schick and Dick tests, D. V. Currey, with a case report by Alan Greenwood, after which very excellent and practical papers were presented by the following:—T. N. Marcellus, Georgetown, "Some results of treatment by endocrines"; W. O. Stevenson, Hamilton, "Recent advances in surgery"; W. J. B. Brown, Niagara Falls, "Nasal accessory sinus infection"; D. A. McClenahan, Hamilton, "Relationship of medical officers of health to the medical profession"; W. K. Colbeck, Welland, "Cranial and intra-cranial injuries"; J. W. Tice, Hamilton, "Recent advances in medicine." At six o'clock, the members and their wives sat down to a delightful banquet at the Clifton Hotel, later listening to addresses by Dr. John A. Macgregor, President of the Ontario Medical Association, and Dr. T. C. Routley, Secretary of the Provincial Association.

During the afternoon, the visiting ladies were entertained by the wives of the Niagara Falls members.

It is a matter of great interest that all of the scientific programme was provided by members of the district. Those who attended voted the district meeting very successful, both from the point of view of splendid scientific material and delightful entertainment.

On Wednesday, September 16th, medical practitioners to the number of 125, assembled in Guelph from the Counties of Brant, Waterloo, Wellington, Oxford, Perth, Huron, Norfolk and North Halton, the occasion being the annual district meeting of District No. 2 of the Ontario Medical Association. The meeting was presided over by Dr. Ward Woolner, of Ayr, counsellor of the district, who was very ably assisted by Doctors Bennetto and Wallace, of Guelph. The following papers were presented at the afternoon session:—Address in surgery, E. W. Archibald, McGill University, Montreal; Arteriosclerosis, Oskar Klotz, Professor of Pathology, University of Toronto; Address in medicine, Thos. McCrae, Jefferson Medical College, Philadelphia. Following the banquet which was held at the College Cafe, the district was addressed by T. C. Routley, Secretary of the Ontario Medical Association, particular reference being made by the secretary to the general activities of the Association during the past year. Unfortunately, owing to illness, the President, Dr. John A. Macgregor, of London, who was also to address the evening meeting, was unable to be present.

It was decided at the short business meeting conducted by the district, that Dr. Ward Woolner should again be nominated to the position of counsellor of the district, while Dr. F. R. Bennetto, of Guelph, was elected vice-counsellor. The district received an invitation from the County of Huron to hold their annual meeting next year in either Clinton, Seaforth or Goderich. The invitation was unanimously accepted.

Under the direction of Dr. E. A. McQuade, Counsellor of District No. 6 in the Ontario Medical Association, the annual district meeting representing the counties of Victoria, Peterborough, Durham, Northumberland, Prince Edward, Hastings and Haliburton, was held in Belleville on Thursday, September 17th. The morning was devoted to clinics at the Belleville General Hospital, these being conducted by the following:—R. R. McGregor, Kingston; G. W. Ross, Toronto, and W. T. Connell, Kingston. The members sat down to luncheon in the hospital at 12.30 p.m. and were cordially welcomed by Mr. R. Tanahill, member of the Board of Governors. The following papers were presented during the afternoon: Differential diagnosis of masses in the mediastinum, Duncan Graham, Toronto; Sprains and other injuries of the ligaments and joints, W. E. Gallie, Toronto; Cancer of the breast, Sir Henry Gray, Montreal. At seven o'clock, the members and their wives foregathered at the Quinté Hotel to partake of the annual banquet. The evening programme consisted of addresses from His Honour Mayor Mikel, Principal Taylor, of Queen's University, and Dr. T. C. Routley, General Secretary of the Ontario Medical Association. Unfortunately, owing to illness, the President of the Ontario Medical Association, Dr. John A. Macgregor, of London, was unable to be present.

During the business meeting, a hearty vote of thanks was tendered Dr. McQuade for his untiring efforts in his capacity as Counsellor of the District. Dr. F. C. Neal, of Peterborough, was nominated Counsellor of the District, while Dr. Geo. Stobie was elected Vice-Counsellor, for the ensuing year.

Number 3 District of the Ontario Medical Association, comprising the Counties of Bruce, Dufferin and Grey, held its annual meeting in Walkerton on Wednesday, September 23rd, under the direction of Dr. T. H. Middlebro, of Owen Sound, Counsellor, and Dr. Malcolm Stalker, of Walkerton, Vice-Counsellor. There was an attendance of approximately sixty from the district.

The following papers were presented in the afternoon session:—The influence of liver extract on blood pressure, W. J. Macdonald, St. Catharines; Physiotherapy, Harold Storms, Hamilton; Vertigo, A. L. Danard, Owen Sound. At six o'clock the annual dinner was held in St. Thomas Church. Short addresses were later delivered by Dr. John A. Macgregor, of London, and Dr. T. C. Routley, of Toronto, President and Secretary respectively, of the Ontario Medical Association.

The following three names were sent on to the nominating committee for consideration for the position of Counsellor of the District for next year:—Dr. A. L. Danard, Owen Sound; Dr. Malcolm Stalker, Walkerton, and Dr. T. H. Sneath, Dromore.

The annual meeting of the Victoria County Medical Society was held on August 7th, at Rosedale at the summer home of the President, Dr. John McCulloch. Addresses were delivered by Dr. W. L. Robinson on "Classification, pathology, diagnosis and treatment of diseases of the breast," and Dr. E. A. Morgan, on "Some common errors in the diagnosis of acute conditions in infancy."

Dr. Geo. E. Wilson, of Toronto, addressed the Hastings County Medical Society at Stirling on September 9th, his subject being "Surgical emergencies."

At a meeting of the Northumberland and Durham

Medical Society held at Brighton on August 28th, Dr. D. King Smith, of Toronto, gave an address on "The diagnosis and treatment of the common skin affections."

On September 4th, the Victoria County Medical Society met at Lindsay. Dr. W. E. Ogden, of Toronto, gave an illustrated talk on "Too-late versus pre-clinical diagnosis of tuberculosis."

The Kent County Medical Society met at Chatham on September 10th, when the following addresses were given:—"Genito-urinary diseases," by Dr. Robin Pearse; and, "The treatment of diabetes," by Dr. W. R. Campbell.

On September 10th, Dr. H. A. Dixon, of Toronto, addressed the Peterborough County Medical Society at Peterborough, his subject being "Common skin affections," with lantern slide illustrations.

A telephone exchange has been instituted in the Academy of Medicine, Toronto, and the Academy wishes to say that the telephone operators of the exchange will be happy to be of service to any visiting physician.

N. B. GWYN

MANITOBA

The election of officers at the recent annual meeting of the Manitoba Medical Association resulted as follows:—President, Dr. D. A. Stewart, Ninette; First Vice-President, Dr. A. P. MacKinnon, Winnipeg; Second-Vice President, Dr. G. W. Rogers, Dauphin. Members of Executive Committee, Dr. F. L. Jamieson, Carman, Dr. P. G. Bell, and R. R. Swan, Winnipeg.

The registered attendance was 193 which is about 40 per cent. of the total medical population of Manitoba. The following resolutions were passed:—

1.—That services rendered to wards of the Dominion Government, i.e., Indians, immigrants and soldiers, by medical practitioners other than government officials be paid for at rates corresponding to those of the Compensation Board.

2.—That congratulations be forwarded to the Canadian Medical Association (a) upon its affiliation with the British Medical Association; (b) upon its public enlightenment programme; (c) upon the acquisition of the Sun Life Fund, $30,000 for extra mural post-graduate teaching.

3.—That an invitation be sent to the British Medical Association to meet in Winnipeg in 1929.

4.—That recommendations be made to the Faculty of Medicine of the University of Manitoba that the number of medical students should be limited and that some means of selection of medical students be adopted.

5.—That the question of specialization without adequate medical training be investigated.

6.—That organized free medical charity should be placed under the direction of the organized medical profession.

7.—That the Council of the College of Physicians and Surgeons conduct an inquiry into the Abrams machine and in the event of its worthlessness being proved take disciplinary measures in respect of those members of the profession using the machine.

8.—That standing committees be appointed to consider and report on matters of ethics, medical education, hospitals, Red Cross work, and State medicine.

9.—That the Medical Advisory Committee of the Red Cross Society, Manitoba Branch, be requested to prepare a report on the conditions existing in the unorganized areas of Manitoba as regards medical service.

The Manitoba Hospital Association met in Portage la Prairie on September 1st and 2nd with a representative attendance. Papers were read by Dr. W. W. Reid, of Vita, on "Organization of the smaller Hospital"; by Mr. W. C. Box, of Souris, on "Management of the smaller Hospital," and by Dr. A. D. McGavin, of Carman, on "Medical Services in the smaller Hospital."

On Oct. 12th, the Winnipeg Medical Society met at luncheon at the Fort Garry Hotel. The guest of honour was Mr. Albert Carless, F.R.C.S., of London, England, who is returning home from a trip around the world in his capacity as Medical Director of the Barnardo Homes. He addressed those present on Prevention in Medicine and Surgery.

A meeting of the Northern Manitoba District Medical Society was held in Dauphin General Hospital on September 30th. A heavy snowstorm prevented a large attendance from outside points but the meeting proved to be interesting. Papers were read by Dr. A. E. Medd, of Winnipegosis, on Eclampsia, and by Dr. Ross Mitchell, of Winnipeg, on Prenatal Care in relation to Maternal Mortality and Morbidity.

The annual meeting of the Council of the College of Physicians and Surgeons was held on October 14th. The officers of the Council are:—President, Dr. J. S. Poole, Neepawa; Vice-President, Dr. J. R. Davidson; Registrar, Dr. J. E. Coulter; Treasurer, Dr. W. G. Campbell. A resolution from the Manitoba Medical Association regarding reorganization of the electoral districts of the province and consequent lessening of the numbers of the Council was referred to the Legislative Committee for consideration and report.

Officers of the Manitoba Medical Alumni Association for the ensuing year are as follows: President, Dr. B. J. Brandson; Vice-President, Dr. A. N. Macleod; Secretary Treasurer, Dr. D. A. MacDonald; Auditors: Drs. J. D. Adamson and C. W. Burns.

Dr. E. W. Montgomery addressed the Inter-State Post Graduate Assembly of America at St. Paul, Minn., on Oct. 12th, on Pernicious Anæmia. Other Winnipeg medical men at the Assembly were Drs. Lehmann, Hunter, Gilmour, Burridge, Chestnut, and N. J. Maclean.

Dr. Gerald O. Grain has been awarded a fellowship in the Mayo Foundation for a course of study in neurology to commence in January, 1926.

Dr. N. H. Blakie has recently returned from Duluth and is now associated in practice with Dr. N. J. Maclean

ROSS MITCHELL

ALBERTA

Dr. L. O. Beauchemin, of Calgary, sailed recently from New York for Europe, where he will spend the next eight months in post graduate work in genito-urinary surgery. He will visit special hospitals in London, Paris and Vienna.

Dr. R. C. Wilson, of Mervin, Saskatchewan, formerly of Keswick, Ontario, has registered in Alberta.

Dr. V. E. Barron, formerly Provincial Medical Officer of Health, is now practicing at Whitecourt.

Dr. R. E. Johnston, a recent graduate of McGill University has settled in Sangudo, west of Edmonton.

Dr. J. A. Allen, of Calgary, has returned from the east, where he spent some time observing modern methods in the use of anæsthetics.

Dr. E. L. Connor, of Lethbridge, left the latter part of September for Europe, where he intends spending the winter time in post graduate work.

Dr. J. S. McEachern, of Calgary, is attending the Philadelphia meeting of the American College of Surgeons, of which body he is second vice-president. He will spend some time in the east before returning. Doctors E. W. Allin, of Edmonton, and A. E. Archer, of Lamont, are also attending the meeting of the American College of Surgeons.

Dr. Foster S. Murray, of Halifax, Nova Scotia, recently arrived in Alberta, where he has commenced practice.

At the annual meeting of the College of Physicians and Surgeons of Alberta, a resolution was unanimously passed asking the Medical Council of Canada to consider the reduction of the registration fee to fifty dollars for those entitled to register under the ten year practice clause. Since there are no examination expenses in this connection it is generally felt that this is a reasonable suggestion.

The question of bringing post graduate instruction to the physicians of Alberta under the grant of a well known insurance company in the east was brought up at the annual meeting of the Alberta Medical Association. A committee was appointed, which recommended that this matter should be left to the executive of the Alberta Medical Association, to confer with the representatives of the Canadian Medical Association, when a decision could be reached as to what is the best course to pursue.

In connection with this subject the physicians of Calgary had the pleasure of meeting Dr. T. W. Routley, General Secretary of the Canadian Medical Association, early in October. There was considerable discussion as to what plans should be adopted so that there would be the greatest benefit to post-graduate teaching to the profession throughout the province, especially to those remote from the larger centres. If plans similar in character to those already formulated in some of the western provinces are carried into effect, physicians in the country districts will enjoy far reaching benefits from this liberal grant. Much interest has been evinced in this project by physicians from all parts of the province.

G. E. LEARMONTH

BRITISH COLUMBIA

The many friends of Dr. F. W. Green, of Cranbrook, wish him a speedy recovery from his recent severe illness.

Dr. C. G. G. Maclean, of Woodfibre, has returned home after a pleasant vacation spent in California.

Dr. R. B. Boucher, Dr. J. W. Thompson and Dr. F. P. Patterson are three of the Vancouver men at present enjoying vacations in the east.

The Publicity and Educational Committee, under the chairmanship of Dr. Neil M. McNeill, has commenced an aggressive compaign for the coming season. Health articles in the press, public addresses, and radio talks are three of the lines upon which the comittee is working.

Dr. H. E. Ridewood, of Victoria, has returned to practice after a lengthy sojourn at his country place at Bradley-Dyne.

Dr. Russel B. Robertson, Victoria, and Mrs. Robertson (formerly of Montreal) are receiving congratulations on the birth of a daughter, on September 6th.

Dr. W. T. Barrett, Victoria, has left for St. Paul, and will visit Rochester, Chicago, New York, and return in about six weeks.

On Monday, September 14th, the Vancouver Medical Association had the pleasure of hearing an address by Dr. John S. Lundy, Head of the Department of Aæsthesia of the Mayo Clinic. Dr. Lundy gave a comparative study of post operative results in 1,200 cases, half of which were operated on under ethylene and ether, and the remainder under ether by the open drop method.

The Executive Secretary of the British Columbia Medical Association has just returned from a trip in northern British Columbia—reports 100 per cent. paid up membership, and a gratifying interest in the affairs of the Association. Advice was asked for and given in a number of economic problems and appreciation expressed of this personal service.

Dr. Gordon C. Kenning, Victoria, left via the Panama for New York and Eastern centres. Mrs. Kenning accompanied him, and they will be away two months.

Mr. Albert Carless, D.B.E., M.B., M.S., F.R.C.S., until recently surgeon to Kings' College Hospital, London, was the guest of the Victoria Medical Society at a luncheon held at the Empress Hotel on September 19th. The luncheon was well attended and the members were very grateful to Mr. Carless for the splendid address he so kindly consented to deliver.

The annual meeting of the No. 4 District Medical Society (Okanagan) was held on September 21st, at Merritt, B.C., when a representative gathering spent a most enjoyable and instructive time. Dr. J. J. Gillis President of the branch society, took the visiting doctors to his fox farm, a novel experience for many of them. A business meeting was held in the afternoon at which matters of a medico-political nature were dis-

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cussed. Officers for the ensuing year were elected, as follows:—President, Dr. M. G. Archibald, Kamloops; Sec.-Treasurer, Dr. L. Jones, Revelstoke; Representative to British Columbia Medical Association, Dr. J. J. Gillis, Merritt.

At the evening session, clinical addresses were given by Dr. F. P. Patterson, Dr. G. E. Seldon, and Dr. Lyall Hodgins. The next meeting will be held at Kamloops.

A meeting of the No. 6 District Medical Society (Vancouver Island, north of Duncan) was held at Nanaimo on September 25th. There was a 99 per cent. attendance of members who greatly enjoyed the clinical addresses given by Dr. Howard Spohn and Dr. W. A. Dobson, of Vancouver. Dr. J. H. MacDermot, Secretary-Treasurer of the British Columbia Medical Association, also gave an account of the activities of the British Columbia Medical Association. The enthusiasm of the members of this society is worth recording. Two members motored seventy-five miles, and two, fifty-four miles to be present, motoring the same distance home, immediately after the meeting broke up after midnight.

The first meeting of the winter session of the Vancouver Medical Association was held on Tuesday, October 6th, when the President, Dr. J. A. Gillespie, delivered the presidential address on "The progress and future of Medicine." Drs. D. E. H. Cleveland, W. W. Bride and J. A. McIver were elected to membership. Matters of general business were dealt with, among them being the question of closer co-operation between the different bodies concerned with medical matters in the province with a view to increased efficiency and economy.

J. EWART CAMPBELL

UNITED STATES

It has been recently announced by Surgeon General Cumming of the U. S. Public Health Service that on December 7, 1925, examinations of candidates for entrance into the Regular Corps of the U. S. Public Health Service, will be held at Washington, D.C.; Chicago, Illinois; New Orleans, Louisiana, and San Francisco, California. Candidates must be not less than twenty-three nor more than thirty-two years of age, and they must have been graduated in medicine at some reputable medical college, and have had one year's hospital experience or two years' professional practice. They must pass satisfactorily, oral, written and clinical tests before a board of medical officers and undergo a physical examination. Successful candidates will be recommended for appointment by the President with the advice and consent of the Senate. Requests for information or permission to take this examination should be addressed to the Surgeon General, U. S. Public Health Service, Washington, D.C.

The Mellon Institute of Industrial Research, University of Pittsburgh, in a circular letter request the publication of a notice regarding the danger to the nervous centres in children from the use of beverages containing coffee. We abstract the following:

In their recent book, *Safeguarding Children's Nerves*, (1924), Doctors Walsh and Foote clearly indicate that there is an increasing nervous instability of American people as demonstrated by the failure of many of our troops to withstand the stress and strain of active service. These writers believe that the numerous cases of shell-shock which were suffered by many American soldiers in the World War were nothing more than cases of hysteria. It is possible that the early use of coffee has had a contributing part in causing the lack of nervous balance that is exhibited by so many adults in this country. The drinking of coffee in the United States is steadily increasing, and the average annual consumption now amounts to thirteen pounds or more per capita. No small portion of this coffee is used by children, as shown by a study of the diet of a large number of children of pre-school age at Gary, Indiana. This survey was made by the Children's Bureau of the United States Department of Labor. The report mentions that "two-thirds of the entire group were found to drink coffee habitually, and forty per cent. to have it more than once a day. Not only so, but in certain of the groups of foreign-born parentage, coffee was drunk by more than ninety per cent. of the children, and three-fourths of the Polish group had it two or more times a day."

It is a well known fact that children easily acquire a taste for coffee and are less willing to drink milk after being permitted to use coffee. Miss Lucy H. Gillett, Superintendent of the Nutrition Bureau of the New York Association for Improving the Poor, says in this connection that "children should never be given tea or coffee, not even to flavour milk. They will more often like milk if they are not first taught the combination of milk and coffee."

There are two important reasons why coffee should not be given to children. First, it has the harmful effect of crowding milk out of the dietary of the child. Second, it is an undesirable and unneeded stimulant.

Dr. Wendell Phillips, President of the American Medical Association, has accepted the chairmanship of the Golden Rule Sunday Co-operating Committee, the object of which is stated to be the promotion of international good will and making provision to supply the needs of war orphans in the Near East. Dr. Phillips calls attention to the excellent medical work that this relief committee has initiated. The "*K*" fund provided by some of the friends of this relief committee has enabled the organization to reach outside of the orphanages and give medical care to many surrounding camps and villages. They have also established a nurses training school both in Athens and Alexandrapol, the metropolis of Russian Armenia. Orphanage centres are now located in Syria, Palestine, Greece, and Russian Armenia. Industrial training is a part of the educational programme in all orphanages, for the children must be ready for self-support by the time they are fifteen or sixteen years of age.

The National Board of Medical Examiners for the United States announce that at a meeting of the executive committee held the beginning of the month, two additional states, Connecticut and Utah, have notified the board that henceforth they will accept their certificate as a qualification for physicians to practise in those states. The certificate of this board of examiners is now recognized in more than thirty-five states, as well as in Great Britain. Dr. Arnold, formerly Dean of the Harvard Graduate School of Medicine, announces that at the June examinations a total of 508 were examined. The examinations were held at thirty medical centres.

Dr. Robert H. McDonald, a graduate of the University of Toronto, Faculty of Medicine, won sixth place in the Part 2 examination last February. He had already obtained the same honour in the examination which took place in September, 1924. Part 3 is a clinical and practical examination to be taken at the end of the hospital interne year. The high character of this examination is universally recognized, and is one of the most encouraging influences in the field of the medical licensure in the United States.

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Book Reviews

The Medical Who's Who. Seventh edition. 834 pages. Price 30s. Grafton Publishing Co., Lincoln's Inn, London, W.C.2, 1925.

This is an attempt to combine the chief features of a medical directory with those of *Who's Who*. Its growth from a volume of 300 pages in 1912 to the present volume of nearly 800, indicates the success which has followed efforts to perfect its value as a source of information regarding regular members of the profession in Great Britain. It must be admitted, however, that as regards the medical profession in Canada the book is decidedly incomplete; one looks in vain for the names of the leading men of the Dominion. This of course the publishers may see fit to remedy in the future, but until then the book's appeal on this side must be limited. The publication itself leaves little to be desired in printing and general arrangement.

H. E. MACDERMOT

Physiotherapy in General Practice. E. Bellis Clayton, M.B., B.Ch. 174 pages, illustrated. Bailliere, Tindall & Cox, Covent Garden, London, 1924.

The need for physiotherapy in the modern practice of medicine does not require to be elaborated. There is therefore undoubtedly a call for manuals which will present the subject clearly and in such a manner as to be readily grasped by the general practitioner. Dr. Clayton has succeeded in producing a work which will serve as a guide to the practitioner and a useful book of reference to the trained masseuse. It describes treatments with massage exercises, radiant heat and electricity, based on the principles used at King's College Hospital in London; and these, it is claimed, can be easily followed by the experienced masseuse.

There is an introductory chapter to help the practitioner who is unacquainted with these forms of treatment; useful explanations are given of massage and medical exercises and of the various ways in which the faradic and galvanic currents may be used.

The book can be readily recommended for its arrangement and highly practical nature.

H. E. MACDERMOT

The Iconography of Andreas Vesalius (André Vésale), Anatomist and Physician, 1514-1564. Paintings, Pictures, Engravings, Illustrations, Sculpture, Medals. With notes, critical, literary, and bibliographical. By M. H. Spoilmann, F.S.A., London, 8vo., pages xxxvii-243. Many illustrations. Price 30s. net. John Bale, Sons & Danielsson, Ltd. 1925.

There are books which are necessarily expensive to publish because they do not appeal to a large reading public, but the world would be much the poorer did they never appear. This volume forms the third of the Wellcome Historical Medical Museum Research Studies in Medical History, and through the generosity of Mr. Henry S. Wellcome it sees the light. It is a beautiful book.

In December, 1914, the quartercentenary of the birth of Vesalius was to have been celebrated in Brussels. Alas, the war intervened, with the result that the projected *Liber Memorialis* with Mr. Spielmann's chapter on the iconography of Vesalius was not printed. Indeed shortly after the commencement of the war the library of Vesalius's own University —Louvain—was destroyed by an act of war, and with it his portrait in oil and the semi-unique vellum copy of his *De Humani Corporis Fabrica*.

Mr. Spielmann is a leading authority on portraits, and is well-known in connection with those of Shakespeare. It would seem that he has said the last word on the pictures and artistic memorials of Vesalius. It is his considered opinion that there is only one portrait which is unquestionably a life-portrait of Vesalius and that is the brilliant wood-cut drawn by Jan Stephen van Calcar which appeared first in the *Fabrica* of 1543. A very full account of this is given, followed by descriptions of all the known portraits which are to be found in various parts of the world.

ARCHIBALD MALLOCH

Diseases of the Bronchi, Lungs, and Pleura. By Frederick T. Lord, M.D. Second edition revised. 776 pages, 107 engravings and 3 coloured plates. Price $8.00. Messrs. Lea & Febiger, Philadelphia, 1925.

This book brings together the advances made in the special field of pulmonary disease; its material is drawn both from a review of the literature, and from the author's experience in the Massachusetts General Hospital. It is the second edition, and the growth of our knowledge in these diseases has called for many changes, and the addition of much new matter, including a chapter on tuberculosis. To make a subject into a specialty is too often the signal for treating it in a manner which does not add to its attraction for the general reader. In this case, however, the general practitioner will find the material well arranged, and well balanced, with references given in the more accessible form of footnotes. It is not a text-book for the student in the most complete sense of the word, but will be valuable to him in extending his reading. The various theories and views which are held with regard to such debatable questions as, for example, the mechanism of massive collapse of the lung, are well stated, and with an absence of dogmatism which is characteristic of the book as a whole.

H. E. MACDERMOT

Diseases of the Ear, Nose, and Throat. Harold Hayes, M.A., M.D., F.A.C.S.. Cloth, pp. 961, with 550 illustrations, including 55 full page plates, mostly in colours. Price $10.00. F. A. Davis Company, Philadelphia, 1925.

This volume is intended by the author primarily for the student and general practitioner. The first 50 pages are devoted to consideration of case forms, office equipment and special instruments. There follows a concise chapter on special examinations. Here, as elsewhere, the numerous illustrations are helpful.

Nearly half the book is devoted to the ear, the chapters on Progressive Deafness are specially interesting. Mastoid and allied operations are dealt with at sufficient length, and there is a chapter on the internal ear with a description of the vestibular tests. In the section on Diseases of the Nose, a timely warning is given: "Beginners in otolaryngology should realize that conservatism is absolutely necessary," and that they should be "in a position to take into consideration all those general physical defects in the system which may cause a reaction within the nose itself." Malformations and injuries receive adequate attention, as do also the common nasal disorders. Medical as well as surgical treatment of diseases of the accessory sinuses is pointed out.

As might be expected, diseases and operations on the tonsil are fully reviewed, the so-called Sluder and dissection method of tonsillectomy being minutely described. The author says: "It matters not what type of operation is performed, provided one is sure

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that the tonsils are completely removed, and that both the anterior and posterior pillars are intact." The book ends with a chapter written by Dr. Charles Imperatori on Endoscopy of the Upper Air Passages and esophagus, the author believing that the possibilities of this branch of the specialty should be grasped by the general practitioner.

The author writes in an easy style which is clear and concise. A few faults in diction are noticed, as for example on page 25 the use of the word "bromidic" in its slang sense, and on page 517 and elsewhere "applicated." A satisfactory index is appended. This book can be recommended to the general practitioner who wishes to enlarge his field of knowledge in this sphere. It will perhaps be of special interest to those physicians in the country who are far from the consultant.

PERCY G. BELL

The Illustrated Medical Dictionary. W. A. Newman, Dorland, A. M., M.D. Thirteenth edition, revised and enlarged. 1344 pages. Limp binding $7.50. W. B. Saunders Co. McAinsh & Co., Ltd., Toronto.

The editor of this volume remarks that since its last edition there has been no "let-up" in the appearance of new terms in medical literature, and the proof of this is abundantly evident in the addition of about 2,500 new words. This rate of increase is almost alarming, but the editorial staff manages to satisfactorily cope with the situation. High commendation must be given for the get-up of the book, its binding, printing, and quality of paper, all of which are details of particular importance in a book of reference. One is also impressed with the large number of editions and revisions through which it has passed.

We must confess, however, to a preference for the spelling of certain words as given in the Oxford English Dictionary; "calibre," for example, not "caliber," and the use of "æ" in such words as "hæmorrhage." Why also should it be "ceserean," instead of "Cæsarean?" Surely something of a historical link is preserved when a man's name is retained in a word with the distinction usually accorded to proper names. We notice a tendency towards this dropping of capital letters in words derived from proper names.

H. E. MACDERMOT

Elements of Surface Anatomy. I. MacLaren Thompson, B.Sc., M.D., Ch.B. (Edin.),Assistant Professor of Anatomy, McGill University, Montreal. Price $1.50. The MacMillan Company of Can. Ltd., Toronto, and E. & E. Livingstone, Edinburgh.

The teaching of anatomy is difficult in any case, but surface anatomy as a subdivision (a necessary evil) presents difficulties of a rather particular kind. It may safely be said that one would never go to a textbook on surface anatomy for anything but the verification of a detail of technical description, and that is a criticism which might still be made of some anatomical textbooks. Dr. Thompson, however, has approached his task from the point of view of the modern anatomist, who strives continually to train the student in the correlation of the facts of anatomy, and to see, as far as may be possible, the practical application of these facts. How difficult it is to do this can only be realized by those who teach anatomy, for it is an insidious danger which attends the premature introduction of the student to the fascinations of medical practice; but it is a danger which has been carefully guarded against in this book, and the author is to be congratulated on his selection of practical and clinical applications. One would have liked to see a reference to the puncture of the subarachnoid space in the suboccipital region (cisternal puncture), but this probably is only one of many points which it was found necessary to leave out.

The absence of illustrations produces at first sight a sense of incompleteness. If, however, one turns to the other similar textbooks (of which, by the way, there are at the moment only two obtainable by students) it becomes clear that the diagrammatic representations of anatomical structures can have only a very limited value. The points to which they draw attention must eventually be felt and seen on the living body. As Dr. Thompson remarks "surface anatomy cannot be taught—it can only be studied. No amount of reading, looking at illustrations, note-taking or witnessing demonstrations will ever educate the tactile and visual senses so as to confer a working knowledge of the subject. The student's first attempt to mark in the lungs and pleuræ without assistance upon the living body will convince him of the truth of this."

This is the first book of its kind to be produced by a Canadian, working in a Canadian medical school. It is a well-conceived and well carried out piece of work, and is worthy of the best traditions of an old and famous Canadian school of anatomy.

H. E. MACDERMOT

The Treatment of Interstitial Keratitis. R. Lindsay Rea, M.D., F.R.C.S. 32 pages, 4 plates. Price 2s. 6d. net. H. K. Lewis & Co., 28 Gower Place, London, W.C.1, 1925.

This little book of thirty pages tells the method of treatment and the results obtained, stated in terms of visual acuity, of ninety-one cases of interstitial keratitis under the author's care. He strongly advises the use of antiluetic remedies for one year at least in addition to the local treatment. He uses novarsenobillon intravenously, or if the veins be very difficult to find in children, sulfarsenol, intra-muscularly. Iodides are used in adolescents and adults.

The author believes that the end results are better and that there are fewer complications, notably deafness, if the antiluetic treatment be persisted in. Three tables are given showing the results in untreated and treated cases and in those in which treatment was delayed. The visual results in those treated early are strikingly better than in the others.

The reviewer confesses to being "enthused" by the author's good results and can recommend this book to the oculist and to the general practitioner.

W. H. LOWRY

Ophthalmic Nursing. Mary Mason Springgay. 133 pages, 67 illustrations Price 5s. net. Methuen & Co. Ltd., 36 Essex St., London W.C.2., 1925.

Text books on ophthalmic nursing are few and far between. A hiatus in one's library may well be filled by this useful little book. The print is good and the paper excellent. The technique advised differs to a slight degree from our western methods. It is interesting to find a full page devoted to the mediæval expedient of "leeching." Evidently the loathsome *hirudo* is still dear to the heart of the English practitioner.

The instructions as to pre- and post-operative care are excellent. The author demands that a nurse be a keen observer and report regularly on condition of tear-sac, teeth and upper air passages.

Prevalent from first to last is a key note of good sound common sense, and of loyalty to the harassed surgeon, who so frequently must instruct and watch nurse as well as patient.

One could wish that this impression of loyalty would reach some of our larger institutions whose graduates appear with but few ideals of duty or loyalty to patient, practitioner or the public.

ALLAN R. CUNNINGHAM